Queen's University

KINGSTON, CANADA

PRINCIPAL'S REPORT

1916-1917

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QUEEN'S UNIVERSITY.

REPORTS OF

PRINCIPAL, DEANS AND TREASURER

Session 1916-17.

The accompanying Reports, having been already approved by the Board of Trustees, are presented to the graduates and other friends of the University for their information.

Queen's University,
28th April, 1917.

Queen's University

PRINCIPAL'S REPORT, 1916-17.

Principal Gordon respectfully submits to the Board of Trustees the following report for the past session, along with the reports from the Deans of the various Faculties and from the Treasurer of the University.

Since the last annual report one of our Trustees, the Rev. Dr. S. Harper Gray, has been removed by death. Dr. Gray had been a member of the Board for only a few weeks, but he had been well known at Queen's not only as a distinguished graduate but also as a Lecturer in the Theological College where his services were very highly prized. His death is a serious loss to the University.

The following changes have occurred in the Staff during the year:

Latin: Mr. Codd, owing to continued illness, was granted leave of absence. Mr. Craig is with his Battery in France, and Mr. Layng was invalided to England. Mr. Clifton has joined the colours. Mr. Cumming has gone to Oxford. Mr. Ernest A. Dale was appointed Acting Professor. Mr. I. C. Demarest was appointed Assistant Professor, and Miss May Macdonnell, Assistant.

Political Science: Dr. W. W. Swanson, Associate Professor, resigned, having accepted a professorship in the University of Saskatchewan. Mr. W. Clifford Clark, formerly Lecturer, has been appointed Assistant Professor.

Philosophy: Mr. N. F. Symons, Assistant Professor, having joined the colours, Dr. L. P. Chambers was appointed Provisional Assistant Professor, taking also the work done formerly by the two Fellows.

History: Mr. A. G. Dorland was appointed Lecturer in History, taking work which last year was done by members of the Political Science Department, now reduced through the withdrawal of Dr. Swanson.

Astronomy: Dr. Buchanan, Associate Professor of Mathematics, has been appointed Professor of Astronomy and Mathematics.

Physics: Dr. J. M. Adams, Assistant Professor, resigned, having been appointed to a Professorship in the University of Saskatchewan. His place has not yet been filled.

Mineralogy: Professor Nicol's resignation, which had been rendered necessary by the state of his health, has left the department of Mineralogy without a head. The work of the Department has been conducted by Professors M. B. Baker and Mather.

Chemistry: Mr. Sterne and Mr. Cadenhead, of the department of Chemistry, resigned before the opening of the session to take important positions in munitions works. Their places have not been filled, but Dr. L. F. Goodwn has been allowed by the Department of Militia to resume his work in the University.

Electrical Engineering. Professor Gill's work has been carried on by Professor J. F. Wilson, late of the University of Michigan.

Mechanical Engineering: Mr. L. S. Eaton has been Assistant Professor with Professor Guillett.

Civil Engineering: Mr. A. Stewart Campbell has been assistant in this Department to Professors E. A. Stone and T. S. Scott.

Metallurgy: Professor Gwillim is in the British Commission as a Lieutenant of Engineers, but, with permission of the Government, he gave part of the session to the work of this Department.

The following is the Registration for the past session as compared with that of 1915-16:—

	1915-16		1916-17	
ARTS—Extra-mural, first registration	107		108	
registered previously	258		209	
Summer School, not included elsewhere	54		65	
		419		382
Intra-mural, first registration	122		98	
registered previously	275		244	
Postgraduates	23		11	
Summer School, not given elsewhere	119		14	
		539		367
SCIENCE—Preparatory year	0		6	
First year	39		9	
Registered previously	135		75	
		174		90
MEDICINE	201	201	212	212
EDUCATION—Extra-mural	13		15	
Intra-mural	76		41	
B. and D.Paed.	40		41	
Summer	28		2	
		157		99

BANKING	497	179
	1987	1329
In two Faculties	18	13
	1969	1316

The number of women students for the past session,—viz., extra-murals 116; intra-murals 226; total 342,—is nearly the same as in '15-'16. In every Faculty except that of Medicine there has been a considerable shrinkage, the total number of men students being only 60% of that of last year.

In Medicine the sustained enrolment has been due to the special Session held last summer whereby a number of men were enabled to graduate in Novembre '16 instead of in April '17, and thus offer themselves several months earlier for overseas service. Each of the other Faculties has suffered, and there has been a marked depletion in those enrolled for the Courses in Banking, as a considerable number enlisted, while others who were required to do additional office work were forced to suspend their studies for a time. It may be noticed, too, that in Queen's Theological College the total attendance was reduced to 15, there being only one student in the first year.

The reduction in our registration has been more serious during the past session than during either of the preceding sessions since the opening of the war, possibly because the longer the war continues the more pressing become the claims for military service on the part of young men who already are, or who might otherwise become, University students. In so far, however, as the decline in numbers is due to the response of our students to the present needs of the Empire, such a reduction is not a matter for regret. The first claim upon Canadians is to help win the war and Queen's is proud that so many of her students have given their service to their country. Details regarding such service are noted in the statements herewith submitted that deal specially with the military activities of the University.

It has been necessary, of course, to maintain all the departments of the University in as complete efficiency as possible, and the temporary appointments made to supply the place of members of staff absent on overseas service have been very satisfactory, but the

decline in numbers with consequent reduction in amount of fees has caused a considerable shrinkage of revenue since the opening of the war. With characteristic liberality, however, our esteemed Chancellor has again come to the help of the University and has met the entire deficit thus incurred, as well as a previous deficit carried for some years, the total amount being $63,236.96. At the same time the Chancellor, recognizing the urgent need of additional endowment and increase of permanent revenue, offers to contribute half a million dollars for this purpose if the friends of Queen's will raise another half million. No time ever seems particularly suitable for raising money and at present there are many claims upon the generous, but there is more wealth in the country than ever before and the adequate maintenance of our Universities is essential to our national progress and welfare. We have to acknowledge, in this connection, our grateful appreciation of the action of the Provincial Government in not only renewing the grant made last year of $100,000 to the University but in giving an additional grant of $10,000. This may specially enable us to do more than we have hitherto done in Scientific and Industrial Research and in thus contributing more effectively to develop the natural resources of the country.

Announcement has been received of a bequest of $35,000 made in favour of Medical Education at Queen's by the late Dr. George Christian Hoffmann of Ottawa, formerly Assistant Director of the Geological Survey of Canada. This bequest, which will very soon be available, is to be applied, according to the will of the donor, to the foundation of two fellowships, $20,000 for a Fellowship for Pathological Research and $15,000 for a Fellowship for extended Surgical studies. Dr. Hoffmann was an honorary graduate of Queen's and an ardent and admiring friend of the University.

Although in common with other Universities Queen's has suffered a reduction in numbers and a shrinkage in revenue through the war, yet the University has felt it to be its highest duty to place its resources as far as possible at the service of the country in this connection. Accordingly when the Government was seeking for available hospital accommodation to receive our sick and wounded soldiers on their return to Canada, and found very serious difficulty in securing suitable buildings, the University after due consideration

offered for this purpose the use of the Arts Building and Grant Hall. In view of the reduced attendance of students, the members of the Staff found that it would be possible to accommodate the Arts classes in the Science buildings without seriously disturbing the work of the Science Faculty, and the accommodation for the Faculty of Education was provided in the Theological College. All alike, both staff and students, wrought with the utmost harmony in carrying out these arrangements so that the life and work of the University have gained rather than suffered thereby. We hope that the buildings we have temporarily surrendered will be restored to their original use by the time that our classes return to their normal condition. In the meantime the sick and wounded soldiers who may be quartered upon our campus will enjoy hospital accommodation unsurpassed in Canada.

The contribution of Queen's to various branches of Overseas Service is set forth in the statement submitted by Dr. Wallace, who is acting as Secretary of the Senate's Commission on our Overseas Record, the service in Hospital and Ambulance being more particularly given in the report of the Dean of the Medical Faculty, to whose energy and active oversight the success of our medical service is largely due. It is very difficult to keep complete records of the enlistments, casualties, promotions and other changes of Queen's men in the various branches in which they are serving, and all assistance that will enable Dr. Wallace to keep a full and accurate record will be greatly appreciated.

The Trustees resolved, at their meeting last October, that "in view of the literary value of modern languages not now studied in this University and the desirability of further commercial intercommunion among the Allied nations in this war, the Board approves of a further extension of the Department of Modern Languages and refers the same to the Finance and Estate Committee." This subject has accordingly received consideration from the Committee and from members of the Staff, and there has been some correspondence regarding it. Italian and Spanish have already a place in our curriculum as well as French and German, and the Department of Modern Languages was never more efficient than during the past session. Enquiry has been made regarding available instruction in Russian, but no satisfactory proposal can yet be

submitted; indeed, it would be difficult to secure a competent teacher until after the war, and it would be necessary, from a financial point of view, that any teacher of Russian should be able to render service also along some other line. We are in a position to offer instruction in Swedish if such were desired.

It is desirable that the Trustees should carefully consider the question of increase of salaries. The recent advance in the cost of living presses with special force on salaried men, as the purchasing power of their salaries has been so greatly reduced. In former years we could truthfully claim that the cost of living in Kingston was much less than in such cities as Toronto and Montreal, and this might be held to excuse the smaller scale of salaries at Queen's. Increased facilities of transportation, however, along with other influences, have of recent years tended to equalize the cost of living in Canadian cities, and, as the rate of salaries has not lately been increased at Queen's, their value is thus considerably less to-day than it was three or four years ago.

Professor Skelton, our leading authority in Economics, after careful examination of available data, regards the purchasing power of salaries in Kingston as approximately 40% less than it was four years ago. Whether the salaries of Queen's be compared with those of other Universities, with those of leading Collegiate Institutes, or with those maintained at Queen's when the general cost of living was much less than at present, it is manifest that the question of increasing them deserves the careful attention of the Trustees. It may be noted that an increase of 16% on the salaries of members of the Provincial Civil Service was voted by the Legislative Assembly in February, 1917.

In addition to the reports of the Deans of Faculties, statements are herewith submitted presenting in some detail the work of various organizations in connection with the University.

DANIEL M. GORDON.

FACULTY OF ARTS. REPORT OF DEAN.

The Arts Faculty has this year completed an extensive work of reconstruction in connection with the courses which lead to the degree of M.A. and those which qualify for teachers' certificates. The import of the changes will be understood from what follows.

The degree of M.A. is now made a post-graduate degree which can only be obtained by a student who has held the degree of B.A. for a year. The M.A. course now extends therefore over five years from Junior Matriculation or four years from Honour Matriculation in at least four subjects. In addition to the Final Honours in two subjects which have always been required for this degree, the candidate must now undertake a certain amount of specific study or research work in the last year, and the courses ars so framed as to encourage intensive or concentrated work on a limited number of subjects in the later years. It is almost a necessary consequence of this change that a new academic standing for students, that of a B.A. with Honours, has been created. This standing may be given at the end of the fourth year to students in the M.A. and the Specialist Courses who obtain sufficiently high percentages.

The other changes have to do with the courses which qualify students for teaching and for inspectors' certificates in the province of Ontario. These courses were drawn up in agreement with the Department of Education and are modelled largely on the plans submitted by that Department. It is in accordance with the Department's demands that the course for Specialists has now been made a five years' course from Junior Matriculation or four years from Honour Matriculation. A certain addition to the work, generally a Final Honours class or its equivalent, has been made in each course.

The courses for High School Assistants and Inspectors' certificates have also been reconstructed at the request of the Department of Education. The new courses are based on the general requirements of the teacher's work in the schools and on the principle that the student who is qualifying as a teacher shall take whatever higher work the options in these courses allow him in the subjects which he is to teach in school, as this is most likely to give him a higher interest in such subjects.

It is perhaps an anomaly—which I understand the Education Department has under consideration—that the pupil in the schools who has passed the Faculty Entrance examination and whose standing is no higher than that of an Honour Matriculant in the university should obtain the same High School Assistant's certificate as the student who has taken the B.A. degree in one of these courses.

One of the difficulties the Faculty had to deal with in constructing these courses for teachers arose from the differences which exist between the system in Queen's and the system in use in Toronto and McMaster Universities. This made a fair equation of work for students qualifying as teachers a matter to be carefully considered both by the Education Department and the Faculty. Queen's system is more intensive in character ,most of its classes, both pass and honours classes, meeting every day in the week and requiring a corresponding amount of work. In such classes the work is naturally heavier than in classes which meet only twice or thrice a week. This is especially the case in the Honours classes of Queen's, which were originally conceived as work for students of exceptional ability only and are taken only in the later years of the student's course. This principle of concentration in Queen's system had to be considered both in the fixing of percentages and in the distribution of subjects.

Some of the Departments in Arts are still working under abnormal conditions owing to the absence of Professors and assistants who are engaged in military work either at home or at the front. This is particularly the case in the Department of History, both the senior professors being absent on service. In general, however, the reports from the different departments describe the work as good or satisfactory. Some even describe it as exceptionally good. One department, however, reports the work in Honours as below the usual standard and ascribes it to the fact that so many of the more advanced students have enlisted. In reply to the usual question as to what improvements could be suggested, one or two professors recommend more "conferences," that is, regular meetings with individual students or at least with not more than two or three at a time. This is always a desirable thing and in some departments is at present systematically done both in the form of seminar work and

criticism of class exercises. Two of the assistants in one department couple the recommendation for conferences with the demand for "less lecturing," one of them declaring that in the lectures the ordinary students "do little thinking or none at all." I know of nothing to prevent any professor in Queen's, who is willing to take the time and trouble, havng as many informal conferences as he desires with his students. To substitute conferences for the regular lectures, however, in any but small classes would involve not only a considerable addition to the numbers or the work of our staff but also an extensive rearrangement of our Time-table. It must also be kept in mind that the comparisons of work on which standing is granted to our students by outside bodies, such as the Education Department, the State Commission of Education in New York and American universities in general, as well as our own estimates of work in other Canadian universities, are all formally based on the system of class lectures. The value of lecturing of course always depends on the lecturer and his methods, especially on his power of presenting his material in a clear and stimulating way and, particularly in certain subjects, more or less in the form of a problem which he presents to the class for solution with an adequate view of the conditions required for its solution. The lecture of a good lecturer is not mere dead information to be set down in the student's note-book, but a lesson, a lesson in perceptiveness and the conditions of sound thinking, in the course of which the class will work with him exactly in proportion to his power of presenting his subject.

I may notice that professors and students in the Arts Faculty have experienced some inconvenience on account of having given up the Arts building temporarily for the purposes of a military hospital. The Faculty readily consented to make this sacrifice on the report of a committee which it had appointed to consider what University buildings were most available for such a purpose. It is owing to the labours of this committee that the change to other quarters has been made with the least possible inconvenience.

Reports on our Extra-mural work and our Summer School will be given elsewhere, but I may notice here the great advantage which is derived from the fact that the two are now worked in connection with each other. Extra-mural students, in addition to the attendance of one or two years required during the regular Session, are also in

certain cases under the obligation to attend the Summer School for the purposes of their laboratory work in Science or for their oral work in languages. In the case of students qualifying as High School Assistants two Summer School sessions may be substituted for one of the two Intra-mural years now required by the Education Department. Summer School students are also required to take the Extra-mural correspondence course the same year. These arrangements have been found to be a great boon by teachers who desire to improve their standing and qualifications. They are a real and distinct advance in the direction of extending university privileges to the country.

James Cappon.

FACULTY OF APPLIED SCIENCE, REPORT OF DEAN.

The record of attendance shows a falling off, as was to be expected:—

By Years	1915-16	1916-17
Preparatory Year		6
First Year	39	9
Second Year	41	24
Third Year	48	23
Fourth Year	35	29
Post Graduates, Special and Six Year Courses.	10	2
	173	93
Arts Students in Science Classes	164	74
Medical Students in Science Classes	109	65
B.Sc. (Agr.)	5	1
Total	451	233

By Courses (exclusive of First Year)	1915-16	1916-17
Course A—Mining and Metallurgy	16	5
Course B—Analytical and Applied Chemistry	1	5
Course C—Mineralogy and Geology	0	1
Course D—Chemical and Metallurgical Eng.	9	6
Course E—Civil Engineering	83	37
Course F—Electrical Engineering	16	14
Course G—Mechanical Engineering	22	8
	147	76

By Provinces, etc.	1915-16	1916-17
Ontario	147	88
Quebec	5	3
Prince Edward Island	1	..
Nova Scotia	3	..
Alberta	2	2
Manitoba	3	..
Saskatchewan	1	..
British Columbia	1	..
England	1	..
United States	5	..
	255	93

Enlistment among science students has been very active, and is still going on. We may expect the numbers in attendance next session to be still less, if the war continues that long. It seems as if the kind of young Canadian who takes up an engineering course is also the kind to respond most quickly to the call to arms. This has been the experience in the other great Canadian universities. In this

connection it will be interesting to record here the honours and distinctions so far won by science students and graduates. Of the twenty-three science graduates and students who went over with Major Macphail, all but two have won commissions, five have been awarded the Distinguished Conduct Medal, two the Military Cross, one was mentioned in despatches, and Major Macphail himself has been mentioned in despatches, and has had the Distinguished Service Order conferred on him. He is also now Lt.-Colonel in command of the 1st Canadian Divisional Engineers. Our representatives in the second Canadian Expeditionary Force have made an equally honourable record. The commanding officer, Major Lindsay Malcolm, has been mentioned in despatches, and promoted to the rank of Lt.-Colonel in command of Divisional Engineers. Of the students and graduates who crossed the Channel with him as members of the 6th F.C.C.E. forty-three now hold rank as officers and N.C.O.'s, four wear the Military Cross, one the Military Medal, and one the D.S.O. The record so far shows that Science contributes to the army two Lt.-Colonels, four majors, nine captains, and forty-nine lieutenants. The great majority of these officers have won their promotion on the field.

Changes in the Staff.

At the close of last session the state of Professor Nicol's health made it necessary for him to resign as Professor of Mineralogy, greatly to the regret of his colleagues. The vacancy thus made has not yet been filled.

In the Department of Physics, Dr. Adams resigned to accept the professorship of Physics in the University of Saskatchewan. The vacancy has not been filled.

In the Department of Chemistry, Dr. Lothrop was advanced from assistant professor to Professor of Biological Chemistry. Dr. Halverson's appointment was not renewed, Major L. F. Goodwin obtained his discharge and resumed his duties in the department. Mr. Cadenhead enlisted in the 50th Battery (Queen's) but was later transferred to take charge of important chemical work in the manufacture of munitions at Shawinigan Falls, Que. He holds the rank of lieutenant. His place has not been filled. The staff has been further reduced by omitting the sessional appointment of one fellow and four assistants.

In the Department of Civil and General Engineering, Professors Scott and Stone were reappointed for the session, and Mr. A. S. Campbell was engaged to assist them. Professor Harvey's appointment was not renewed.

In the Department of Mechanical Engineering, Professor Guillett's appointment was made permanent, and Mr. L. S. Eaton was appointed assistant-professor for the session.

In the Department of Electrical Engineering, Mr. J. F. Wilson was appointed to take Professor Gill's classes for the session.

In the Department of Mining and Metallurgy, Professor Gwillim was granted leave of absence to engage in work for the Department of Militia. Mr. C. W. Drury, on leave of absence for a year, returned, and was promoted to be assistant-professor.

Research

The subject of scientific research as a necessary factor in building up a country's industries has received a great deal of attention in Great Britain of late years. Since the beginning of the war there has been a complete revolution in the British attitude towards this subject, and government and people are now making haste to recover lost ground and to put the nation in a strong position in this respect. In July 1915, there was appointed a committee of Parliament "to direct . . . the application of any sums of money provided by Parliament for the organization of scientific and industrial research." To this was added an Advisory Council composed "mainly of eminent scientific men" to report and recommend on proposals,—

(i) for instituting specific researches.

(ii) for establishing or developing special institutions, or departments of existing institutions, for the scientific study of problems affecting particular industries and trades; and

(iii) for the establishment and award of Research Studentships and Fellowships.

The Advisory Council was given power to initiate such proposals, and it was declared "essential that the Advisory Council should act in intimate co-operation with the Royal Society and the existing scientific or professional associations, societies, and institutes, as well as with the universities, Technical Institutions and other Institutions in which research is, or can be, efficiently conducted." The

scientific societies were to be invited to initiate proposals for the consideration of the Advisory Council, which was also at liberty to receive proposals from individuals. The Advisory Council was "to keep in close touch with all Government Departments concerned with, or interested in, scientific research," and all possible means were to be used to "to enlist the interest and secure the co-operation of persons directly engaged in trade or industry." The Advisory Council was to "work largely through sub-committees reinforced by suitable experts in the particular branch of science or industry concerned . . . . as far as possible persons actually engaged in scientific trades and manufactures dependent on science."

This comprehensive scheme for the organization, stimulation, and support of scientific research was the subject of memoranda from the Minister of Public Works of Victoria, and from the Premier of New South Wales, suggesting that the scheme be made applicable to the whole empire. It was thereupon declared to be "not outside the existing powers of the Committee of the Privy Council to aid a research intended to benefit a British industry, even though the research may be conducted beyond the borders of the United Kingdom. For instance, the best means of recovering a metal found in one of the Overseas Dominions and needed for the production of some new alloy required by the British Metallurgical or Engineering Industry, might be the subject of a research conducted in that Dominion at the instance and at the cost of the Committee of Council." Professor Kirkpatrick's researches on the recovery of cobalt from Ontario ores would be a typical example. This metal is used in making the chromium-cobalt alloy, stellite,—one of the best materials for a steel-cutting tool. The other constituent, chromium, can be extracted from ores found in Quebec Province. A research is now being carried on in the metallurgical laboratory to find an improved method of treating these ores. This research would evidently come within the meaning of the Committee's statement. It is also suggested in the Committee's memorandum that researches might be carried on in the Mother Country "for an Overseas Government (or any body or institution acting under the authority of the Government), the Committee, or its Advisory Council acting as agent." "The pooling or consolidation of the resources of the Empire for the purposes of scientific research is a stimulating idea, but though pure science is

cosmopolitan and disinterested, it is in its application to trade and industry inevitably affected by the divergent commercial interests of individuals and Governments, and the wide separation in space and the great diversity of the components of the British Empire are still material considerations of which full account must be taken in thinking of any scheme for unified administration." This is evidently the view taken by the Canadian Government. It has appointed its own Committee and Advisory Council. Our representative on the Council is Professor S. F. Kirkpatrick.

In order to do her part in the nurture of scientific research, Queen's must be well staffed and well equipped in all departments of science. It is particularly necessary that those professors who show aptitude for research and zeal in its pursuit. should not be handicapped by long hours of teaching. So far, professors have been labouring under this difficulty, and it is to their credit that, in spite of this, they have kept up a creditable output of research.

In the Department of Physics Professor Clark reports that Mr. M. J. O'Neill has been engaged in a magnetic survey of the region about Kingston, and that Mr. H. H. Sheldon has been working on the *Radio-activity of small Quantities of Purified Samples of the Commoner Elements.* Owing to the large demands upon the staff in carrying on classes the research work of professors has been almost at a standstill this year, but will be taken up again as soon as conditons permit. Professor W. C. Baker published the following papers:

An Improved Resonance Model.
School of Science of Mathematics, October, 1916.

A New Method for the Measurement of the Wave Length of Light with a Coarse Grating.
School of Science and Mathematics, November, 1916.

The Angular Momentum Laws and a New Apparatus for their Verification.
School of Science and Mathematics, December, 1916.

In the Department of Chemistry, Professors W. L. Goodwin and W. O. Walker have investigated the flares now in use at the front and have suggested to the Munitions Board a method of improving them. Professor Walker has been examining an interest-

ing by-product of the manufacture of acetic acid with a view to discovering uses for it. Professor L. F. Goodwin has been experimenting with apparatus for absorbing gases from mixtures.

In the Department of Mining and Metallurgy important researches have been carried on under the direction of Professor C. W. Drury, as follows:—

1. The Recovery of Chromium and its compounds from the Chromite desposits of Quebec, by O. D. Boggs, B.Sc.
2. Removal of copper from cobalt-nickel solutions, by Messrs. W. Burrows, B.Sc. and R. C. McQuire.
3. Recovery of Metals from Slags, by Professor J. A. T. Robertson.
4. Concentration of Sudbury Nickel Ores, by Mr. H. A. Steven.
5. Separation of cobalt and nickel, by Mr. A. J. Drury.

In the Department of Mechanical Engineering an extensive series of automobile tests has been made, the engine being loaned for testing purposes by the McLaughlin Motor Co. of Oshawa. The results of these tests were published in the *Mechanical Engineer* (Manchester, England) of Dec. 7th, 1916. A further series has just been completed on another engine of different type loaned by the same company.

In the Department of Geology, research work has been carried on by Professors M. B. Baker and K. F. Mather. A report has just been issued by the Bureau of Mines, Ontario, as part 3 of the annual report. entitled, "The Geology of Kingston and Vicinity," which involves field work done during the summer of 1915 and 1916, with research work carried on during the winter session. This report deals with the economic features of this vicinity, particularly the deposits of mica and feldspar, as well as deposits of granite suitable for building stone, paving blocks and cobble stones. A company is now developing one of these latter areas near Findlay station, 12 miles east of Kingston, and is shipping large quantitties of cobble stones, which had formerly to be imported from Europe or the United States. The area is carefully mapped, and the information was considered of such importance that the Department of Militia has withheld the issue of the map until the close of the war.

In connection with this work fossils from the Trenton limestones on Wolfe Island were collected and identified by Professor Mather, and a report, with plates, forms an appendix to Professor Baker's report of this district. The collections, which are now of value, have been added to the Paleontological Museum in the Department of Geology. The new species found are more completely described in a paper now being published in the Ottawa Naturalist.

During the past vacation, Professor Baker was engaged in examining certain economic deposits of Northern Ontario, including Long Lake Gold Mine, south-west of Sudbury, and the Alexo Nickel Mine in the Porcupine district. Additional investigations, on certain serpentine areas in the Timiskaming district for nickel, chromium, asbestos, etc., were also carried on, and during the present session reports of these have been prepared and are now in press, to be issued with the annual report of the Bureau of Mines for 1916.

Investigations were carried on by Professor Mather in company with Dr. E. M. Kindle of the Geological Survey, Ottawa, upon the sediment and life in the bottom of the deeper portions of Lake Ontario, also examinations of the glacial drifts in the vicinity of Napanee and Kingston, the results of which are being published in an early number of the Journal of Geology. Professor Baker reports that all his advanced students, specializing in Geology, have enlisted for active service, but that some of the present second year students are electing Geology for their special course, and that further investigations in the course of a couple of years will be undertaken by them.

The work of the session has been very satisfactory. Professors uniformly report that the small classes have enabled them to do more individual work,—greatly to the benefit of the students. There is a growing feeling that lecturing to large classes is, to some extent at any rate, a waste of time,—particularly when it is made the occasion of extensive note-taking. It would be well for the University to adopt for most purposes a maximum size of class, not to be exceeded except for special lectures. W hen the number of students in any class rose above this maximum, two courses would be open, either to limit the number of students or to increase the staff. It is a fact commonly recognised that the teaching at small colleges, where the classes

are always small, is usually more effective than in the larger universities, where possibly the ambition for size has led to an unfortunate result,—too large a student body for the size of the staff. It might be well now, when conditions have reduced the number of students, to study the subject and formulate a careful educational policy in this respect for the whole University.

W. L. Goodwin, Dean.

MEDICAL FACULTY, ANNUAL REPORT, 1917.

Dean Connell reports as follows:—

On behalf of the Medical Faculty I beg to report,—

This annual report relates to three different sessions of the medical school.

(1) The War Session beginning May 1st and terminating December 1st, 1916, attended by second, third, fourth and fifth year students. The registration in this session was 129. Fifty-six graduated.

(2) The regular session opening September 28th, 1916, to terminate April 25th, 1917, attended by first and second year students. Registration 67..

(3) The second war session, beginning December 1st, 1916, and to terminate July 1st, 1917, attended by third, fourth and fifth year students. Registration 82.

The school will be closed from July 1st next to September 17th when supplementary examinations will be held. On September 26th classes will begin for the 65th session for all five years.

Work of the School.

This has been carried on without interruption all the year with the exception of the first two weeks in August and the usual Christmas vacation. Most of the staff have been on continuous duty and those who teach the third, fourth and fifth years will not be free this year till the end of June. These conditions apply also to the 82 students registered in the second war session. So far there is no evidence that anyone or any interest has suffered from the prolonged work. On the contrary our experience establishes the possibility of keeping a medical school open continuously, under a different organization of the staff and courses, with a high degree of efficiency and with a moderate outlay.

Few changes have taken place in the staff. Dr. J. W. Campbell resigned the professorship of Therapeutics. Dr. D. E. Bell, Demonstrator of Anatomy, resigned to accept an important position as Assistant Medical Officer with the Workmen's Compensation Board at Toronto. Dr. Denholm, Fellow in Pathology, resigned to go

overseas. No new appointments have been made to fill these vacancies as the duties have been taken over by other members of the staff.

All students now registered are in the five year academic course. There will be no regular graduating class this spring nor until the summer of 1918.

Length of the Session.

The Ontario Medical Council has fixed a teaching session of 30 weeks as the minimum which will hereafter be required from candidates for the qualifying examinations. Complying with this regulation the next (65th) session opens September 26th, 1917, and lectures close May 1st, 1918. Examinations will be held throughout May and the Faculty asks for a special medical convocation on Wednesday, May 29th, 1918.

Length of the Course.

The Universities of Toronto and McGill have announced that, beginning in 1918, six years' academic work will be required to graduate in medicine. The Faculty carefully considered this proposal but has been unable to recommend its acceptance and adoption by the Senate. A memorandum setting forth the position taken was prepared and, after approval by the Senate, circulated widely among those interested. Copies were sent to members of the Board of Trustees and the University Council. A reply to the memorandum has been issued by the authorities of Toronto University and this is now under consideration. The main reason advanced in favor of the six year course is "that the action of these universities (Toronto and McGill) is in line with the practice in Britain as well as with that of the highest education in the United States." The reference to the 'practice in Britain' is not correct. In response to an enquiry directed to Sir Donald MacAlister, President of the General Medical Council of Great Britain, a letter has been received from the Acting Registrar of the Council, dated February 28th, 1917, in which it is stated (1) That the General Medical Council of Great Britain adopted a five year course in May, 1893; (2) that there has been no proposal to lengthen this to six years; and (3) that in December, 1905, there was a proposal that the preliminary scientific studies of Physics, Chemistry and Biology should be taken prior to the commencement of medical study so as to leave a period of five years for

medical study proper. This proposal was not adopted. As to the United States there is no University there which conducts a medical course extending over more than four years. The recent attempt to raise the standard of matriculation by enforcing one or two pre-medical years, is so far, not a success. This statement is based on the Ninth Annual Report of Dr. Pritchett, President of the Carnegie Foundation (see pages 53-64). The opinion of Queen's Faculty is that action of such great importance to the profession and public should be taken first by the Ontario Medical Council which represents all the universities of Ontario teaching medicine and the general body of the profession as well. If the Council prescribes a sixth year in the curriculum Queen's will adopt a similar standard for the M.D. degree. As reciprocity in registration now exists between the Ontario Medical Council and the General Medical Council of Great Britain some understanding will be required between these two bodies before such a radical change can be made. In the meantime Queen's is content to comply with the regulations which are essentially those of the General Medical Council of Great Britain.

The General Hospital.

In 1903 when the writer of this report became Dean of the Faculty, the number of indoor patients in the General Hospital was about 1300. For the year which closed 30th September, 1916, the number had increased to 4,300. This increased amount of work has been taken care of with the same plant and outfit as existed in 1903, except that thirty private roms have been added. During this period there has been a complete reorganization of the clinical teaching, but it is carried on under great disadvantages. The wards are totally inadequate and, owing to structural defects in the old main building, it is impossible to renovate them to advantage. The accommodation for infectious diseases is also unsatisfactory and, indeed, the whole institution needs extension and reorganization. Chancellor Douglas has interested himself in this matter and has subscribed $100,000 towards a fund which will be used to make the hospital modern in every respect. A joint committee of the Faculty and the Board of Governors of the Hospital, with Mr. J. M. Farrell representing the Board of Trustees of the University, has engaged a firm of architects who are specialists in hospital construction to study the problem and to submit general plans and estimates. The successful completion of

this project will place the clinical facilities of the medical school on a very high level and will round out the reorganization of the school which began fifteen years ago.

Research Fellowships.

A bequest of $35,000 from the late Dr. George Hoffmann, of Ottawa, endows two research fellowships, one in Pathology and one in Surgery. These will first be available for the graduating class of 1918. The terms of the bequest are satisfactory and such as will enable the Faculty to award them in a manner likely to produce definite results. They will undoubtedly prove an attraction to students to come to Queen's.

The Medical School and the War.

Colonel A. E. Ross, C.M.G., the senior representative of the Faculty at the front, has again been promoted. As Director of Medical Services, Canadian Corps, France, he has command and oversight of all the medical work connected with the Canadian troops on active service in France. This is a highly responsible position but one for which Colonel Ross is fully qualified by temperament, training and experience. It is gratifying to his colleagues and friends that his excellent work, first, in command of No. 1 Field Ambulance, then, as A.D.M.S. of the First Division has been freely and fully recognized, by his decoration of C.M.G., by being twice mentioned in despatches, and, more recently, by promotion to the highest command in the medical services in France.

Queen's Hospital has been known officially for the past year as No. 7 Canadian General Hospital (Queen's). It moved from Egypt in May of last year and opened under canvas on June 5th at Le Treport with one thousand beds. In November it moved into permanent quarters at Etaples where it has since been doing active work. There are now two thousand two hundred and ninety beds for patients. Under the command of Colonel Etherington and with a staff made up almost exclusively of Queen's graduates excellent work has been done. Colonel Ross speaks highly of the hospital and suggests that it should be continued indefinitely as a Queen's unit after the war. In cooperation with the local Red Cross Society and with the permission of the Government, supplies continue to be sent directly to our hospital in France. These supplies and comforts

have been of great help to the unit and are greatly appreciated by the patients.

Queen's Field Ambulance was organized a year ago and during last summer was under canvas at Barriefield Camp. It did all the camp work during the summer months, operated a field hospital, transferred all patients to and from the city and military hospitals, supplied orderlies and assistants to the military hospitals, the convalescent homes and the Mowat Hospital. The Officers with those attached for instruction and duty have done an enormous amount of work locally and throughout the military district. Two drafts of men and officers were sent overseas and finally the Ambulance has gone as a Unit, over strength in men and officers, to be known as No. 15 Field Ambulance and to be the First Field Ambulance of the Fifth Division of Canadians in France. Great credit is due to Major Filson who organized and commanded the unit. He has gone overseas in command but he will be junior major in France. At our request Colonel Ross nominated two Queen's graduates, Lieut.-Col. Stone and Major C. R. Graham, who have been with the ambulance services in France from the beginning, to be the senior officers. Colonel Ross writes that these arrangements have the cordial approval of the medical and other authorities in England and France, and that, under the officers named, he is satisfied our new unit will give a good account of itself.

The Ambulance is continued here as a Depot Ambulance for training and to supply reinforcements for overseas. In command is Major Kenneth Mundell who had two years' military training in the Royal Military College before studying medicine. He accompanied Col. Ross to France with No. 1 Field Ambulance and later was returned to complete his studies. On graduation in December last he re-enlisted for overseas but at the request of the Faculty he has accepted the new command. The ambulance will continue to supply orderlies for the various hospitals and especially for the new Queen's Hospital for returned soldiers.

Our most recent military activity is the Queen's Hospital for returned soldiers for which the University has given the new Arts Building and Grant Hall and the Medical Faculty is to furnish the personnel. The County Council has given the upper floor of the Court House as a dormitory for the nurses and the Richardson Convalescent Home is to be used for the orderlies. About five hundred

beds is the capacity of the two buildings assigned for patients, and it is proposed to find means to extend the number to one thousand by adapting other buildings near by or by erecting new structures on the campus. The patients in this hospital will be those requiring active treatment and not yet ready for convalescent homes. Lieut.-Col. W. T. Connell is in command and he is emminently qualified by his experience overseas to organize and administer such a unit. He will be able to do this new work and carry on the duties of the Pathological Department, as well as supervise the laboratory work of the 3rd Military District. Additional assistance will be supplied both for teaching and for the practical work of the laboratories.

It is of interest to note that thirteen members of the teaching staff at home are at present in uniform doing military work in addition to college and other duties. One of these is Lieut.-Colonel R. J. Gardiner, A.D.M.S. of this military district. In co-operation with him it has been possible to render much assistance in finding graduates to enter the medical services. A very large percentage of our recent graduates have enlisted and many of the older men have sacrificed position and practice to serve. Notable among these are Dr. L. H. Fraser, who came from Peru, and Dr. J. W. Warren of North Dakota. Both of these are now overseas and deserve recognition for their initial sacrifice.

Return of Students.

Application was made a year ago, through the Department of Militia, to the War Office for the return of 27 third year students who were serving with Queen's Hospital in France, that they might resume their studies. After prolonged negotiations the request was finally refused on the ground of general public policy. We are now informed that these 27 men are returning for the purpose indicated. These students had completed two years of the old four year course. Some special attention must be given to them to prepare them to enter the fourth year of the five year course next autumn.

All of which is respectfully submitted.

J. C. Connell, Dean.

FACULTY OF EDUCATION

Dean Coleman submits herewith the Annual Report of the Faculty of Education for the session of 1916-17.

Following are the statistics as to enrolment up till the present date. Since in the case of candidates for Specialist's certificates enrolment is allowed up till the first of May, the figures for the present session in that particular are incomplete.

GRADUATES IN ATTENDANCE.

	1915-16	1916-17
Men	17	5
Women	27	19
Total	44	24
Non-Graduates (with Faculty Entrance standing) in attendance.		
Men	4	3
Women	30	16
Total	34	19
Total number in attendance	78	43
Extra-mural candidates for Teachers' Certificates.	15	14
Candidates for Degrees in Pedagogy (extra-mural)	41	43
Candidates for the Specialist's Certificate only (extra-mural)	9	9
Total enrollment	143	109

It will be noticed that in common with other Faculties of the University there has been a considerable decrease in the number in attendance as compared with that for last year. While this decrease is manifest in the attendance both of graduates and of non-graduates, it is most noticeable in the figures showing the comparative attendance of men graduates. The almost total disappearance of men graduates from our classes is a valuable commentary upon the whole-hearted way in which Queen's has responded to the appeals for overseas service.

It is not always easy to assign adequate and complete reasons for fluctuations in attendance, but the one single reason which occurs to all in this connection is the present war. The war has not only lessened to a marked degree the number of men in attendance, but, by creating new home responsibilities for women and new necessi-

ties for their employment in business callings, it has for the time being lessened relatively the appeal to them of the teaching profession.

The attendance of non-graduates (students with Faculty Entrance standing only) has probably been affected also by a temporary diminution of the number of such students due to the present raising of departmental standards. Recent inquiries by the Department of Education have developed the fact that of the total number of such students whose homes are east of a line drawn from Port Hope to Peterborough (including the students from these two places) all but ten are in attendance at the Queen's Faculty of Education. This, when compared with the figures for other years, indicates a strengthening of the appeal of the Queen's Faculty within that part of the Province which may be regarded as its own particular constituency.

For some years past the Annual Reports of the Dean have called attention to the fact that the Queen's Faculty of Education is the only training school for teachers in the Province which is not provided with a special building for its work and with the extensive equipment which the existence of such a building makes possible. Other training institutions have their own special buildings and an equipment more or less adequate to their work. They also have an annual revenue considerably in excess of that which the Queen's Faculty receives. This constitutes for Queen's a permanent and an increasing handicap.

The outstanding need of the Faculty of Education is that of an experimental school which shall perform something of the function which a research laboratory performs for a Faculty of Applied Science. A school of this type would also serve more completely the needs of the Faculty as regards demonstration and practice teaching than our present arrangements can.

The extra-mural part of our work has increased steadily of late years so that at present a considerable portion of the time of the staff is occupied in such work as preparing bulletins and outlines of work, conducting correspondence, reading theses, etc. During the present year five theses by candidates for the Degree of Doctor of Pedagogy have been presented to the Faculty. This is equal to the total number of theses presented for this degree during the previous

nine years of the Faculty's history. This aspect of the Faculty's activity cannot be without a considerable measure of benefit to the University since it ministers to the needs of a very important element in the community, viz., Inspectors of Schools, Normal School masters, teachers in High and Public Schools, who, because of the claims of their work, cannot spare the time for actual attendance upon University classes for purposes of advanced study during the regular session.

The Faculty of Education intends to offer next summer as a part of the regular work of the summer session courses as follows: (I) A course for those candidates for First Class and High School Assistant's certificates who, under the regulations of the Department of Education, are exempt from attendance during the session; and (2) Courses in the Science and History of Education for candidates for Degrees in Pedagogy. As students in this latter course are drawn from nearly every Province in the Dominion from Cape Breton to Victoria, this aspect of the work, if it develops as hoped for, may in time be of national significance.

I should like to acknowledge the indebtedness of the Faculty of Education to certain Arts Professors for assistance which they have given in connection with various phases of our work. Professor A. P. Knight is providing for our students this year (as he has during two previous years) a course of lectures on School and Community Hygiene. Professor W. T. MacClement and Professor R. K. Hicks are each giving their second year of service to the Faculty, the former as Lecturer in Botany and Nature Study, and the latter as Lecturer on Methods in the Teaching of French and German. The standing of the Faculty in the estimation of students and of the educational world outside has been greatly enhanced by the valuable assistance which these gentlemen have given to us. I should like to acknowledge with gratitude also the services which have been rendered by Professor A. S. Ferguson in connection with the examinations for Degrees in Pedagogy.

In view of the changes which were made necessary through the handing over to the Government of the New Arts Building for hospital purposes, the Faculty of Education is extremely fortunate in its new quarters in the Theological College. Thanks are due to the

authorities of the University and of the Theological College for their kindness in this connection.

In spite of the decreased attendance and of the slight confusion inseparable from a change of quarters in mid-year, the work of the Faculty has gone on with exceptional smoothness and, I believe, with increasing efficiency. The spirit of the staff has been excellent while the student body has, by regularity of attendance and enthusiasm for their work, made the duties of administration and instruction a source of genuine pleasure.

H. T. J. Coleman.

SCIENTIFIC AND INDUSTRIAL RESEARCH.

The subject of Scientific and Industrial Research has received serious consideration during the past session, all the more on account of the action taken by the Hon. Sir George E. Foster in forming an Advisory Council, on which a number of Universities are represented to co-operate with the Government in this matter. The Finance and Estate Committee, in consultation with members of the Faculty of Applied Science, appointed a committee, under the convenership of Professor Clark, to present a statement of the research work that is being carried on at Queen's, and to indicate the lines along which we may most helpfully conduct more extended research. It is essential, if Queen's is to maintain her rank among Canadian universities and is to contribute her proper share to the advancement of knowledge and to the development of our national resources, that increased attention and support be given to the work of research. The special committee submit the following report:—

Report of Committee on Scientific Research.

The committee has discussed the matter of government aid for research with Professor Kirkpatrick, our representative on the Honorary Advisory Council, and the conclusion, based on our present

knowledge of the attitude of the government, is that very little help is to be expected to establish research work and that aid will be given only to develop work already under way. This places a very heavy burden on Queen's University if she is to share in the scientific development that seems imminent in this country. Unless extensive financial assistance from other sources than the government is forthcoming, it is not likely that Queen's will take her proper place in this most important work.

For example, in the Department of Metallurgy, where so much good work has been done and in which Professor Kirkpatrick has gained such a splendid reputation, he does not feel that he can expect much from the government without a better plant and men enough at work to guarantee that the work can be carried on profitably. If this is true of the Department of Metallurgy, where the applications of the work are so obvious and immediate, it is much more serious in other departments, where the results of the researches are not so obviously practicable. It would be a pity if the development of the uses of the nickel, cobalt and chromium and their alloys, should be beyond our reach.

In departments like Metallurgy and Chemistry, where so much of the work is of immediate and commercial application, it is probable that when the work is established on a secure basis, aid from the government and manufacturers may be expected to develop the work of these departments further. In Biology, a good deal may be expected of the government under similar terms, but much of the work of such a department falls outside of the probability of such aid and must be supported by University funds. In Botany, Bacteriology, and Physics, this latter kind of support is perhaps all that can be anticipated, except in rare cases. It is Professor Kirkpatrick's opinion that help for pure science must come from University funds or private sources, while for the development of commercial applications state aid may be expected after the work is far enough advanced to justify such aid.

The committee feels that the development of research in the scheme here proposed should be confined at first to departments which, in spite of meagre opportunities, have been carrying on research under rather difficult conditions, and in which enough work has been done to justify the expectation that with adequate support

these departments will increase the amount of their work and improve its character. The departments selected are: Chemistry and Chemical Engineering, Metallurgy, Physics, Animal Biology, Botany, Bacteriology.

The appended complete list* of published papers and researches completed in these departments is presented as being perhaps the best evidence of power to carry on the work. We think that you will agree that the amount and character of the work is creditable, when you take into account the heavy burden of teaching carried by our staff. Most of us have felt that our first duty has been our teaching, and with our small staff the time and energy required for this have made continuous research nearly impossible, save in the holidays.

The committee believes that a considerable amount of new equipment will be necessary to carry on the work already projected. An estimate of the amount will be found below. Then assistance for professors engaged in research, maintenance of research departments, and wages of mechanics and other laboratory assistants as well as a system of fellowships and scholarships will call for a considerable sum annually preferably from an endowment.

The Chemistry Department wishes to continue or begin work on the following problems:

Research on Camphoryl Thiosemic Arbazide and its derivatives, Walker and McRae.

Utilization of Waste Acetone Oils. L. F. Goodwin.

Electrification of Gun Cotton during Drying. L. F. Goodwin.

Safranine test for Glucose. A. P. Lothrop.

Chemical Constitution of Ovomucoid. A. P. Lothrop.

Sulphite Waste Liquors. Composition and possible uses. W. O. Walker.

Chemistry of Milk Products, including

Preparation of casein in commerce;

Better utilization of skimmed milk, e.g. making soft cheeses for home consumption;

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*See Appendix.

Encouragement of larger home consumption of cheese by manufacture of special whole-milk small soft type of cheese.

Effect of cold storage upon keeping qualities of butter after removal to higher temperature.

Effect of Pasteurization of milk upon the vitamines with consequent results to digestion.

Effect of copper in steam coils used in pasteurization. W. O Walker

In the *Department of Metallurgy,* an investigation has already been begun on the preparation of metallic chromium from chromite and Professor Kirkpatrick wishes to undertake a comprehensive study of the peculiarly Canadian metals, nickel, cobalt, and chromium and their alloys with and without iron.

In the *Physics Department,* a magnetic survey of the region near Kingston is being carried on by Mr. M. J. O'Neill. The magnetic elements are subject to strange anomalies around the city, both in the harbour where the compass is quite useless for navigation and, also, in the surrounding country. Mr. O'Neill will continue his problem next year if means can be found to obtain a scholarship for him. Professor Clark is continuing his work on telephone transmitters as time permits. He is also continuing his researches on the viscosity of ether near the critical temperature. Professor Baker and Mr. Sheldon are working on a study of radioactivity of small quantities of specially prepared and purified samples of the commoner elements.

Professor Robertson is very anxious to undertake

An investigation of the influences of one gas on the spectrum of a second with which it is mixed;

An investigation of the relation between the extent of ionization and light emission in an electrodeless discharge:

An investigation by the method of positive rays of the nature of positive ions emitted from a heated strip of platinum.

Dr. Pound has done a large amount of work on the secondary radiation from alpha rays and desires to continue.

Professor Clark proposes the establishment of a complete low temperature laboratory ,in which study of refrigerator machinery and methods can be carried out and researches at very low tempera-

tures. This latter scheme will require the erection of a fairly large liquid air plant with which the separation of oxygen and nitrogen of the air may be studied. Also, the plans include a plant for the liquefaction of hydrogen in quantities proficient for experimental purposes. There is no cryogenic laboratory of the type in Canada. The experience of Professor Clark in Leiden fits him for undertaking this work.

In the *Department of Botany,* the following work is under way:

By W. T. MacClement—

(1) Control of Fungi attacking Fish and Fish Eggs.

(2) The Fungi that injure Trees and Timber.

And by G. B. Reed—

(1) Factors influencing the permeability of protoplasm to oxygen, and its relation to respiration.

(2) Respiration in plant roots under varied soil conditions.

(3) Bacterial treatment of Peat for the production of nitrogen fertilizer and plant vitamines.

In the Department of Animal Biology,

Dr. A. P. Knight is working at

The Conservation of the Lobster Fisheries.

A. B. Klugh has the following problems under way:

1. Effect of Environment on Histological Structure of Grasses.
2. Effects of Mountain Environment.
3. Distribution and Ecological relationships of Canadian Spiders.
4. Notes on Canadian Formicidae.
5. Animal Habitats in the Lake of Bays Region.

In the *Departments of Pathology and Bacteriology,* the following problems are to be undertaken:

1. Investigation of the pneumococcal types responsible for Pneumonia.
2. Prevalence of lues as determined by the compluetic test, in cases admitted to wards of General Hospital, Asylum for Insane, and Penitentiary.

In order to carry out the plans outlined above, the committee estimates that the sum of about $100,000 will be necessary for

equipment. This will be distributed among the various departments according to their needs.

But the first thing necessary for this scheme or any other, aiming at the development of Scientific Research, will be the relief of certain members of the staff for research purposes. This help must be generous in case of men working on purely scientific problems, as their summers may be given up to such work where there is no financial return. Workers on commercial problems should be treated somewhat differently according to some scheme to be developed.

In addition to this assistance, research assistants must be provided. The inducements to these may be somewhat different in different departments.

The committee proposes the establishment of assistants, fellowships and scholarships for this purpose. The scholarship might be $600 each, and the fellowship $1200 each. For work during the summer months the circumstances vary very much in different departments, but there will have to be some provision for payment of summer workers.

In addition to this, it will be necessary to provide for the employment of at least one skilled mechanic and one proficient glass-blower. The machinery and equipment necessary for these two men is provided for in the estimate for equipment, but the wages and maintenance are not so provided for. To carry on all of this work and maintain these departments will require not less than $25,000 to $30,000 annually.

We desire above everything else to have genuine research stimulated to a high degree of efficiency, but do not wish to have any artificial enthusiasm or unwise effort by men who are not ready to throw themselves unreservedly into the work. While the amounts mentioned do not cover all that our plans might include, we feel that it is perhaps wise to begin on a moderate scale and achieve results which will find naturally the means of furnishing the desired and expected healthy growth of this most important university and national work.

A. L. Clark,
Convener.

REPORT OF SUMMER SCHOOL, 1916.

The sixth session of the Summer School of Queen's University is now ended, and when we consider the great decline this year in the attendance in all university classes in Canada, we must regard the session just completed as having been very satisfactory indeed. The total registration was 99. Of these three attended classes in the Faculty of Education as well as in Arts. Not only has the numerical attendance of the session been gratifying, but the spirit shown by the students in their earnest class work, their hearty recreation, and their loyal enthusiasm for the University has been most encouraging for the future success of the Summer School. The new regulation requiring registration as extra-mural students in May for all those desiring to write examinations in September, must be recognized as an additional barrier in the way of students. Its necessity having been shown to them, the students have accepted it cheerfully, along with the increased expense to them which it involves. As usual with new regulations it has brought about some unexpected results, and these will require some adjusting during the coming year. The new subject for this year—Modern History—has, in the hands of Mr. W. N. Sage, been a great success.

For the first time we have this year offered a course in Physical Training. The Department of Education of Ontario gives two courses of Physical Instruction leading to certificates, an elementary course, and an advanced course. Each of these demands the whole energy and most of the time of the student for the summer term. We decided to offer a course which is also required by the Department of Education but which can be taken at the same session with classes in academic subjects. This is the Strathcona Physical Training Course for Grade B Certificate. With the advice and co-operation of the Department of Militia—who pay a part of the salary—we secured the services of Miss Eva Jamieson, of Ottawa, as instructor. The class numbered 22 and both instructor and students gave attention and energy to the course. The time required was thirty hours of instruction. The results of the examination given by Lieut.-Col. Gillespie have not yet been made public, but the benefits to the members of the class were very apparent. Many students

expressed their intention of taking this course of training, if it is given next year.

The different classes in Arts, the names of the instructors, and the numbers of students are as follows:

English—Dr. W. E. McNeill.....Junior 24, Senior 22, Prel. Hon. 1
French—Mr. W. N. Conacher.....Junior 14, Senior 6,
Latin—Prof. J. F. Macdonald.....Junior 14, Senior 4,
Philosophy—Prof. A. S. Ferguson ...Junior, 6, Senior 4,
History—Mr. W. N. Sage.....Modern 19
Mathematics—Prof. C. F. Gummer...Junior 10, Senior, 2
Physics—{ Dr. A. L. Clark and
{ Prof. Robertson .....Junior 19, Senior 9,
Chemistry—Prof. W. O. Walker.....Junior, 12, Senior 4, Prel. Hon. 3
Animal Biology—Mr. A. B. Klugh.....Pass 15
Botany—Dr. G. B. Reed .....Pass 25

The course of General Lectures, eight in number, proved as usual very interesting and instructive, and received careful attention from both the students and the city press. The lecturers and their subjects were as follows:

Dr. D. Buchanan—The Planetesimal Theory of the Solar System.
Rev. Dr. Macgillivray—Prehistoric Man.
Dr. O. D. Skelton—The Races of Mankind.
Prof. A. S. Ferguson—The Beginnings of Freedom.
Rev. Dr. Wallace—The Contributions of the Semitic Peoples.
Mr. H. Michell—National History and the Supply of Gold.
Prof. J. F. Macdonald—The Poetry of Masefield.
Prof. W. O. Walker—Poisonous Gases in Warfare and Protection against them.

That the students might become acquainted with each other, and find the time spent here more enjoyable than it otherwise could be, the executive of the Summer School Association arranged an excursion by steamer through the Thousand Islands. The excursionists were entirely of the University students and staff, and an unusually pleasant time was spent.

A Social Evening was also held in Kingston Hall; and, finally, the wives of the faculty of the Summer School held an At Home for the students on the University Grounds. These entertainments together with tennis and baseball prevented the session from becoming a monotonous grind, which the excessively warm weather would have rendered very distasteful both now and as a memory. On the con-

trary the students closed the term with every evidence of satisfaction and unabated energy.

A new executive was elected for Queen's Summer School Association at the earnest request of Messrs Curtis and Ramsay who have served for many years. The students marked in appropriate manner their appreciation of the remarkable way in which Mr. J. T. Curtis has given of his ability, his energy and his money to forward the cause of Queen's Summer School. Mr. H. J. Vallentyne, past president, now with the Canadian Overseas Forces, was made Honorary President, Mr. C. C. Goldring—Principal of a public school, Toronto—President; and Mr. C. R. Jarvis, also of a public school, Toronto, was elected Secretary-Treasurer. Various methods for the promotion of the Summer School were discussed. The importance of bringing the matter before the teachers of the different inspectorates at the Teachers' Institutes which meet in October, was recognized. It was decided to recommend that a pamphlet setting forth the aims, methods and advantages of the Summer School and of extra-mural study in Queen's should be prepared by the University and be ready for distribution at these meetings. In connection with this, over 40 students volunteered to speak at these Institutes in favor of Queen's Summer School, or distribute the above mentioned literature, or do both.

There was also an organized movement to have professors from Queen's invited to speak at as many as possible of the Teachers' Institutes.

Such active loyalty to the University is abundant evidence of the high value set upon Queen's efforts to extend the privileges of University study among the teachers of Canada.

As our Faculty of Education, because of its arrangement with the Toronto Faculty of Education, could not offer work for the degrees in Pedagogy, but only that for professional First Class and High School certificates, but few students were available. In spite of the smallness of the class, Dr. Coleman gave attendance and regular lectures, and employed some other members of the staff to lecture upon special subjects.

The students in Education expressed themselves as greatly delighted with the attention given to them.

Respectfully submitted,

W. T. MacClement, Director.

BANKING COURSES.

Professor Skelton submits the following statement regarding the Courses in Banking:—

1. *General*: In the general courses this year we have merely marked time. The enlistment of a large percentage of the members of the staff of the chartered banks and the increase of business activity have combined to leave very little leisure to the men still on office duty. Under these circumstances it has not semed possible or advisable to attempt to expand the scope of the work, and we have limited our efforts to taking on enough new men to keep the organization intact.

The number of men enrolled and taking work in the Fellows Course this year was, first enrollment 50; previous enrollment 134; total 184.

The tuition arrangements were much the same as last year: Mr. Eckardt had charge of the work in Banking Practice, Mr. Robertson in Accounting, Mr. Michell in Money and Banking and Commercial Law, Mr. Clark in Corporation Finance and Mr. Milliken in Economics.

It is planned to make a thorough revision this year of the study materials, and to provide for the issue of a monthly bulletin to keep the men enrolled, and possibly ex-students, in touch with new developments.

2. *Spanish Course.* The courses prescribed by the Bankers Institutes of the United Kingdom include optional courses in French and German. Thus far no demand has come from our banking students for tuition in these subjects, but this past year an opportunity opened to introduce work in Spanish. The Royal Bank, which has been opening many branches in Central and South America, desired to give members of its staff who were to be transferred to these offices instruction in Spanish. Arrangements were therefore made with the Executive of the Canadian Bankers' Association to add Spanish to the Fellows' Course, as an optional subject, and with the Royal Bank to give tuition in Spanish. Fifty men enrolled, of whom forty are continuing the course. Under the very efficient direction of

Professor Hicks and Professor Brovedani a course specially adapted to the needs of such students was drawn up and instruction begun in October. Gramaphone records are provided to supplement the written work. The staff changes involved in the absorption by the Royal of the Quebec Bank at New Year's caused some disturbance in the work, but both instructors speak highly of the results achieved. Tuition will be continued until the end of May. The course normally will cover two years. If the number of applicants warrants, the University will provide, in Kingston, during the summer of 1917 (July 2—August 4) a course in Spanish, for intensive practice in speaking.

REPORT OF THE SCHOOL OF NAVIGATION.

The School of Navigation has been conducted on about the same lines as last year, the session being lengthened, however, from 6 to 12 weeks. The school opened earlier than last year, viz., December 12, which date seems to be satisfactory.

The staff has been the same as in previous sessions, viz.,

Captain W. Steeves, Chief Instructor in charge.
Professor A. L. Clark, Lecturer in Physics and Meteorology.
Professor D. Buchanan, Lecturer in Astronomy.
Examiner, Captain H. W. King, Dominion Supervisor of Marine Examination.

Certificates were sought as per schedule below:

Certificate.	Number taking work.
Master coasting	2
Mate coasting	1
Master inland passenger	3
Mate inland passenger	9
Master minor waters, passenger	1
Minor tug	1
Inland tug	1

At this time it is impossible to give the results of the examinations as all have not been held.

Captain Steeves has given instruction in Navigation, Seamanship, Ships' Business, Rule of the Road. Classes in these subjects were held five days per week from 10 to 12 and 1 to 5.

Four lectures were given by Professor Buchanan on the elementary portions of practical astronomy. These lectures aimed to give the mariners an understanding of the motions of the heavenly

bodies and to acquaint them with the principal stars and constellations which are of use in navigation. The motions and phases of the moon were discussed in detail, and its influence upon the tides and the weather considered. Time and latitude were determined approximately by means of the transit, and the moon, planets and other objects of interest in the sky were observed with the telescope.

I have given a series of talks on parts of Physics of practical interest to the men. These included a discussion of Terrestrial Magnetism, the Mariner's Compass, Atmospheric Pressure and the Barometer. Other talks on storm, clouds and other meteorological phenomena were planned but were not given this year because of illness.

In all of these talks we found, as last year, the men keenly interested and a number of the seamen of the city, not enrolled in the school, attended the meetings. The discussions by the men, while fruitful and lively, were not entered into as keenly as last year. It would be difficult to find a group of men more interesting to talk to than these sailors.

Captain Steeves makes the following recommendations:

1. That the talks on Physics and Astronomy be a permanent feature of the school, both for the benefit to the men and to the university.

2. That the session open on December 11, and continue for 12 weeks.

3. That deviation cards and tables and Newton's blank charts be obtained and sold to the students so that they might take them with them during the summer. The estimated cost would be 50 cents per student. They could be obtained from Norie and Wilson, 59 Minories, London E. C., England. The students should provide their own parallel rules and dividers.

4. As it is impossible for one who has defective vision, or is color-blind, to qualify for Master's or Mate's certificate, each seaman should be submitted to an eye test before being enrolled or accepted as a student.

This report has been prepared in collaboration with Captain Steeves.

A. L. Clark, Director.

REPORT OF THE SUPERVISOR OF EXTRA-MURAL WORK.

The number of students registered extra-murally in the past twelve months is given as follows:

	First registrations		Previously registered		Total	
	Men	Women	Men	Women	Men	Women
Summer Session, 1916	23	19	105	41	128	60
Winter Session, 1916-17 ..	58	47	161	68	219	115

The total number of registrations in the two sessions is 522, as compared with 495 in the preceding winter and summer sessions. The increase is largely due to the fact that Students of the Summer School are now required to register extra-murally for the first part of the summer in order to qualify for the September examinations. Of the 88 students registered in the past summer, 76 were registered also in the Summer School, and 52 are registered again for the present session.

In the past four or five years there has been a marked improvement in the assistance given to extra-mural students. The instruction is better organized; and, with a few exceptions, it is in the direct charge of more experienced persons. Members of the regular staff in all the departments are giving extra-mural instruction in their own subjects, and in most of the departments they are doing it all. This is made possible by the decreasing number of intra-mural students, and by the increasing sense of responsibility for our extra-mural students on the part of the staff itself. This session with 334 students, the instructors are 3 student tutors, 3 fellows or assistants, and regular members of staff. Three years ago, with 346 students, the instructors were 13 student tutors, 3 fellows or assistants, and members of staff. It would be difficult to compare the efficiency of this year's teaching with that of three years ago, or to apply any unit of measurement to either; but, unless all standards fail, the work of this year must be the more efficient and satisfactory. In the course of the development of our extra-mural system, the student tutor has played an important and worthy part, and the tutorial assistance given by him has been all that could have been expected. But the extra-mural teaching must keep pace with the increasing importance of the work as a means of University extension; and the University must, as a matter of ultimate policy, place it in the hands of permanent men whose growing experience will be of value.

In this matter two lines of development are open to the University. First, the tendency of the past few years may be followed up and extra-mural instruction be considered a part of the duties of the regular staff. Second, extra-mural instruction may be given over to a set of men whose duties shall be confined to this work alone. There are advantages and disadvantages attached to either of these methods. The danger of the first is that the time and energy of the staff be overtaxed; but the remedy lies in added assistance. The danger of the second is that intra-mural and extra-mural courses would tend to move apart in aims and sympathy. Separation of this kind would be serious, and the remedy not simple. Whatsoever the details of development may prove to be, two facts should be maintained as the central policy of the University; namely, that temporary instructors should be replaced by permanent men as soon as circumstances permit, and that the extra-mural work should continue to be, as far as possible, one with the intra-mural in its spirit, its direction, and its standards.

In order that the extra-mural work should be both mechanically efficient and personal in its character, the University should at the earliest opportunity appoint a man who should give his whole time to it. The experience of the past has shown a great need for service of this kind which at present cannot be done.

J. Matheson,
Supervisor of Extra-mural Work.

REPORT OF LIBRARIAN.

The following donations were made to the Library during the seesion 1916-1917:

Donated	3566
Purchased	1482
Total	5048

We have received a large number of publications from H. M. Stationery Office, many of which had been delayed during the War, and of which the back numbers have now nearly all been sent. There is again a delay in the receipt of these publications owing to the submarine campaign. We are also receiving many bulletins and other

publications from various Agricultural Experiment Stations in the United States. This accounts for the increase in our donations.

Purchase of foreign books, except a certain number of French books, has almost entirely ceased for the present.

Owing to the difficulty of obtaining skilled labour, and the enormous increase in the price of materials, it was found impossible to obtain satisfactory tenders for the building of the new library, and the Trustees judged it necessary, with great regret, to defer the work for the present.

The work of the Library, though much lessened in some directions, owing to conditions due to the War, has gone on steadily, and our work with extra-mural students has increased and is much valued by them. The work in the cataloguing department is also very satisfactory.

During the past year we have twice received applications from some of the German prisoners at Fort Henry for Library privileges. This matter was carefully considered by the Library Board, but as the military authorities decidedly opposed such a scheme, the request was refused, after referring it to the Senate.

The receipts for the last session were considerably less than in previous years, but we had a large balance in hand. The Financial Statement for the session 1916-1917 is as follows:

Receipts (including balance)	**$5865.68**
Expenditure	**3395.97**
	$2469.71

Lois Saunders, Librarian.

REPORT OF THE DEAN OF WOMEN.

There have been registered as intra-mural students in Arts this year 191 women and in Education 35. Of the 191 in Arts, 5 have been transferred to the list of extra-mural students and 3 have returned home, abandoning their University work, so that, as the session closes there are in attendance in both Faculties 218 women. Of these 78 were registered intra-murally this year for the first time.

The following table shows how the women students have been lodged:

At their own homes in Kingston	46
At the Kingston Y.W.C.A.	20
At the Residence	16
At Mrs. Lytle's	7
At Notre Dame Convent	5
At each of three other places, 6, total	18
At one other place	5
At each of five other places, 4, total	20
At each of seven other places, 3, total	21
At each of nineteen other places, 2, total	38
At each of seventeen other places, 1, total	17
At the homes of relatives or friends	9
Returned home and rooms re-let	4
Total registration	226

Of the 51 houses not definitely named, 32 have been occupied by girls in previous years, and 19 are new places this year. I feel that there has been a distinct improvement in lodging-house conditions this session. The new houses added to the list are of a decidedly better class, and fortunately the price of rooms and board has not been greatly advanced, notwithstanding the prevailing high cost of living. The Levana Council has given most careful attention to the enforcement of its rules, printed copies of which, in booklet form, have been in the hands of all women students.

In general the health of the women students has been exceedingly good. No one so far has been obliged to give up her University work because of ill health, although several have lost one, two, or three weeks of lectures on account of minor illnesses. In an Appendix I have described the more serious cases.

The women students so arranged their Red Cross work this year that it was unnecessary for them to ask outside assistance of any kind. Miss N. Clinton and Miss P. Meadows were made directors of the work and they have performed the duties of their office most conscientiously and successfully. Supplies have been purchased with funds from the Y. W. C. A. and Levana treasuries supplemented by contributions and the proceeds of a tea. The work has consisted of the knitting of socks and scarves, the making of pads, and the rolling of bandages by machine. In this connection mention should be made of a gift to the Queen's Hospital from the Captain Fryatt Chapter of Daughters of the Empire, Utica, N.Y., through Miss Helen Macdonald of the Final Year in Arts. The gift consisted of hospital supplies to the value of $192 and in addition fourteen pairs of socks, The high esteem in which Miss Macdonald is held by this Chapter,

which she organized and of which she is a member, prompted the sending of the donation. Mention should also be made of the Christmas stockings prepared and sent by the Levana Society in October to the 46th Battery in command of Major Gill. The women students of Queen's deserve great praise and credit for the able manner in which they have executed their plans for various kinds of patriotic work. Below is a tabular statement of what they have accomplished this year:

Amount expended for Christmas stockings for the 46th Battery...	$125
Amount expended by Levana and Y.W.C.A. for Red Cross supplies	$ 62
Amount contributed by Levana and collected by Miss H. Macdonald for Mowat Hospital	$ 10
Amount received from Ice Hockey game and given to Red Cross..	$ 25
Amount contributed by women students in the "Giving Campaign"	$342
Number of pairs of socks knitted, and contributed through Miss Macdonald	34
Number of scarves knitted	9
Number of pads made	660
Number of bandages rolled by machine.....	1344
Value of the gift from Utica	$192

There has been much discussion this year among the women students relative to Physical Training for the women of Queen's, and the Levana Society is asking the Senate Committee to consider whether it is not possible in the future (1) to have the physical examination made by a woman physician; (2) to provide a woman gymnasium instructor for the women students; (3) to arrange such a course as will lead to a certificate which may be of use to teachers; and (4) to offer a course of ten or fifteen lectures on physiology and hygiene to the new girls each year. I should think, in view of the resignations of Mr. Bews and Mr. Dawson which will necessitate some re-adjustment of the work in Physical Training, that the women students have chosen an opportune time to ask for a consideration of these matters.

The members of Levana feel very grateful to the committee in charge of moving from the New Arts Building for the very comfortable quarters provided for them in Carruthers Hall. The change was made with very little inconvenience to them, and Levana was glad of the opportunity to do "a bit" for the great cause, by sacrificing her pleasant room in the New Arts Building. I find my own office next to the Levana Room even more comfortable and convenient than the one I have heretofore occupied.

In closing this report I wish to thank all the women students for the splendid spirit which they have shown throughout the year, and for their hearty co-operation in carrying out suggestions.

Very respectfully submitted,

CAROLINE E. MCNEILL,
Dean of Women.

REPORT OF THE ALMA MATER SOCIETY.

As in all phases of college activity, the Alma Mater Society has felt the pinch of war time conditions, not only financially, but also in the many requirements necessary through enlistment.

At the beginning of the present session, but few of the officers were available and vacancies had to be filled. Business, however, with practically a new executive, went on as usual under the capable leadership of Mr. McFadden.

The first problem facing the Alma Mater Society last fall was the matter of Social Functions. After much discussion it was decided that there should be three Faculty Functions, the Conversazione and a social evening for the Faculty of Education. This arrangement seemed to meet the approval of all concerned.

Elections, which took place early in December, were replete with innovations. The Levana Society, which represents about one-third of the present student registration, decided that they must have representation on the Executive. In consequence, the election of two women students was accomplished—Miss Lottie Whiton as Assistant Secretary, and Miss Eva Coon, as a Committee-woman. This innovation was not more momentous, however, than the placing of a khaki-clad in the Presidential chair. These two facts will serve to show , in a subtle way, what Queen's has done and is doing for her Empire.

The Spring term, under the new executive, proved to be one of the most exciting since 1912. The old difficulty regarding the promiscuous use of the letter "Q" again was the cause of the difficulty. The Levana Society wished the privilege of granting a "Q" as shown in the designs submitted, in Ladies' Athletics. The very fact, however, that, although the letter was so arranged as not to conflict with the "Q" granted in Intercollegiate Sports, it was a "Q", made it impossible constitutionally to be granted in any subordinate athletics.

This ruling was given not only in accordance with the constitution, but also as a sacred tribute to those of our athletes who so proudly wore their letter while at Queen's and who have since sacrificed their lives in the defence of the Empire.

Another definite decision arrived at, was the abolition of the old system of rushes and provision made for the substitution of some other form of initiation which should be decided upon by the various Faculty Societies concerned. This drastic step was taken after most mature consideration, and we feel assured that, with the concerted action pledged by the various faculty societies, the present generation of students at least will see no more of the dangerous, and in some instances extremely offensive, ancient form of initiation.

Competition in the various contests under supervision of the Alma Mater Society was very keen, the series of debates in particular, being of the highest order. The Oratorical contest was also well contested. The winner of the gold medal, Mr. McLennan, gave a most eloquent and instructive oration on the subject "Gladstone".

Two illustrated lectures were greatly appreciated by the students. The first, given shortly after the New Year, was entitled "England in Peace and War" by Dr. Griffith-Jones of Bradford College, England. The second was a very interesting and instructive lecture on "Trench Life at the Front", delivered by Professor (Major) L. F. Goodwin, who spent nearly a year in the thick of the gruelling fight undergone by the 2nd Battalion in conjunction with the others of the first Canadian Contingent.

This report, at this most troublous time in the world's history, would hardly be complete without some tribute to our honored dead. The sacrifice the Alma Mater Society is paying, cannot be expressed in words. During the past session some of her noblest sons have fallen. Athletes, whose names resounded about college halls in former days, scholars and public men who proudly pointed to Queen's as their Alma Mater, have been among those heroic spirits. It is beyond our scope to mention all by name, suffice it to say, that the Alma Mater Society respects and honors their memory.

W. R. Hughson,

President of Alma Mater Society.

REPORT OF QUEEN'S UNIVERSITY ALUMNAE ASSOCIATION.

The Alumnae Association during the year can report progress, although the goal it has been aiming at, namely, the new Women's Residence, has not yet been reached. The difficulties of the labour situation owing to the war, and the fact that all the funds had not been secured, made it necessary to postpone building operations for the present. A full report of the work of this Association was presented to the University Council at its meeting on April 26th, 1916, and this was followed by an interesting discussion, culminating in a resolution urging the Board of Trustees to take up the matter, and assist the women graduates in their efforts to finance the undertaking. The Trustees, however, felt it unwise to assume any additional financial burden, and the Association was advised that building had better be delayed till $50,000 was on hand. A gift of $10,000 from the Chancellor, Dr. Douglas, gave us an opportunity to invest in war bonds. Besides the $20,000 invested in City of Toronto debentures, we have $14,000 invested in Anglo-French bonds, and a balance of $95.31 in the Bank of Montreal.

Since its reorganization in 1911, more than 300 alumnae have joined the Association. The paid-up membership to date is 186, but this will undoubtedly be added to.

One new feature of the work of this Association is the publication of an annual—"Alumnae News"—containing the constitution of the Alumnae Association, the officers, the annual report, births, deaths and marriages of alumnae, the degrees, prizes and medals for the past year, articles of interest to the alumnae on University subjects, a complete directory of all women graduates and undergraduates, etc. If the first number is a fair sample, the Alumnae members are indeed privileged to receive this recognition of membership, which serves as a real bond of union, especially to those who are too far away to attend the annual meetings.

Our Alumnae Branches in different centres have generously contributed supplies for Queen's Hospital in France, Toronto and Ottawa sending donations for the Christmas stockings. Interest in this work has also been shown by Calgary and Edmonton. Some branches are contributing to the purchase of another gramophone, which has given so much pleasure in the hospital wards. Six of our

members are actively engaged in hospital and patriotic work overseas—Miss Edith Rayside, B.A., matron of Moore Barracks Hospital, Shorncliffe, who has been honoured by receiving the Order of the Red Cross; Miss Helen Drummond, nursing-sister at No. 7 (Queen's) General Hospital, France; Miss Marion Lavell, nursing-sister at the Duchess of Connaught Hospital, Cliveden, England; Miss Dorothea Goodwin, who has been doing V.A.D. and Red Cross work in London hospitals under the St. John Ambulance Corps, and who has lately been accepted for military hospital work; Miss Katharine Day, B.A., V.A.D. at St. George's Hospital, London, and Miss Muriel Shortt, who is doing her part at the Maple Leaf Club, London.

The Committee on the Representation of Women has this year secured the election of Miss E. J. McManus, Ottawa, as the representative of the Association on the University Council.

All of which is respectfully submitted.

HENRIETTA S. HENDERSON.
Secretary.

REPORT ON PHYSICAL TRAINING.

The Convener of the Senate's Committee on Physical Training, Professor M. B. Baker, reports as follows:

The Senate Committee on Physical Training for the past session was composed of Professor M. B. Baker, as convener, with Dr. J. C. Connell and Professor MacClement as members. Mr. John Dawson, the secretary of the student Athletic Committee, kindly acted as secretary also for the Senate's Committee.

The Committee met on the 13th of October and drew up a program for the session, and found that, owing to the small number of students registered, the number of hours of instruction could be much reduced. This would make it possible for Mr. Bews to continue the work of instruction without interfering with his military duties. Through the kindness of General Hemming, the Committee was able to secure the services of Mr. Bews for part of the afternoon for the low figure of $200.

The Committee also provided at once for a medical examination of the students, and instead of a lump sum as formerly, the Committee secured the services of Dr. Asselstine, a member of the medical

faculty, at the rate of $1.00 per student; this fee to cover reexamination of doubtful cases and follow-up examination of defective cases. The Committee also aranged for the presence of a trained nurse to assist in the examination of the women students.

The results of the medical examination are quite interesting, and a few points are cited, which would possibly be of interest to the trustees. It should be remembered that only those students, who have entered college for the first time, are under discussion. In Arts, 48 men were examined of whom 38 per cent were found defective and unfit for military service. This did not include 4 cases of flat-foot, who would also probably be refused by the militia. In so far as the defects were not prohibitive, suitable exercises were prescribed to aid to correct the defect. Of the lady students the percentage was equally high, most of the trouble being curvature of the spine.

The Science men numbered only 10, and of this number only one was defective. In Medicine, 45 students were examined of whom 27 per cent showed defects, most of which were benefited by suitable exercises.

At Christmas, Mr. Bews' time was further required for instruction throughout military district No. 3, so that he was forced to give up his work at Queen's. The Committee secured the services of Mr. Palmer, Physical Instructor at the Collegiate Institute, for the balance of the session. Beyond a slight disturbance of the work in the early part of January, therefore, the instruction has been carried on throughout the session.

The Committee tried, throughout the early part of the session, to find a means of giving some recognition for this physical drill that would apply in some way to the Education Department's requirements for physical training. Dean Coleman, of the Faculty of Education, was added to the Committee for this purpose. The Committee had several meetings in which it developed that, without giving considerably more time to this work than two hours per week, the requirements could not be met, and moreover that a large part of the training was in the nature of First Aid, Elementary Physiology, and Anatomy, and that only a portion of it was physical drill. It did not appear possible, then, to dove-tail this class in physical drill with the requirements for teacher's certificates. The Committee is still hoping, however, to establish something in the shape of the necessary

training during the Summer School. This has been left largely in the hands of Professor MacClement, who is making the necessary inquiries and will try to solve the difficulty.

The Committee has been pleased with the improvement shown in students taking these classes and feels that parents will appreciate this phase of Queen's work. There unfortunately seems to be a desire on the part of the lady students to avoid this class, and applications for exemption have been received from time to time throughout the session. The exemptions are regularly made to students who play on any of the regular teams, hockey, ground-hockey, foot-ball, or basket-ball, and it is interesting to note that, aside from this class of exemption, no male student has asked exemption on any other ground. The Committee feels that the lady students should be discouraged from asking exemption from a class so eminently suited to their requirements.

M. B. Baker, Convener.

MILITARY ACTIVITY AT QUEEN'S.

Professor Wallace, Secretary of the Senate's Committee on Military Record, presents the following statement:

The greatly decreased attendance at the University is proof of the loyal response made by the students of Queen's to the call of the Country for men to serve in the Military Overseas Forces. The figures given below, showing the numbers of graduates and undergraduates on active service, so far as the University's Committee on the Overseas Record has been able to make those figures complete, make even clearer the contribution Queen's has made to the Empire's need. And when to nearly 550 undergraduates in the Faculties of Arts, Science and Medicine, who have enlisted during the three war-sessions, 1914-15, 1915-16, 1916-17, there is added the unknown number of those who otherwise would have been in attendance, it may be realized how deeply the war has influenced the life of the University. The response has been all that could be expected, and in the senior years particularly it is true that almost every eligible man has offered his services.

The various units bearing the name of the University, already overseas, have given good account of themselves and have added lustre to the good name of Queen's. The No. 7 Canadian General Hospital (Queen's) under Lieut. Col. F. Etherington, C.M.G., since being transferred to the Western Front, has had heavy work to do

and has made a reputation for itself for efficiency in every department. It has been loyally supported by the graduates and friends of Queen's at home, and the untiring efforts of the ladies have ensured a steady supply of Red Cross supplies.—Major L. W. Gill's 46th (Queen's) Battery, C.F.A., had their grim part to play in the battle of the Somme and suffered some casualties. Especially may be noted the very sad death of four men, three of whom were highly-respected Queen's students,—P. C. Caverhill, B.A., E. F. Corkhill, B.A. and F. F. Laturney (Science), all of whom were killed by a shell exploding in their dug-out. During the winter the Battery has been on a quieter part of the line.—The 50th (Queen's) Battery, after some months of training in England has been split up to serve as reinforcements for several other batteries. Captain D. G. Anglin, the former Commanding Officer, retains his rank and is now attached to the 53rd Battery. Very recently the No. 15 Canadian Field Ambulance (Queen's) consisting of 10 officers and 182 men, and also a draft of 15 officers proceeded overseas after spending the winter training in Kingston. At the same time a draft of 50 men from the 72nd (Queen's) Battery with Lieut. J. B. Wilkinson ('15 Sci.) was sent over.

At home the 72nd Queen's Battery under Major R. R. Carr-Harris is at full strength, but it is reported than, instead of going overseas as a unit, 150 men and three officers (one of whom will be Lieut. J. A. Petrie, B.A. '01, B.D. '06, late Presbyterian Minister at New Westminster, B.C.) will shortly be sent over as a draft, leaving the Commanding Officers with a small nucleus of a Battery to again recruit up to strength.—The 253rd (Queen's University Highlanders) Battalion, under Lieut.-Col. P. G. C. Campbell, holds a record for rapid recruiting and is already at about half strength, which, considering the conditions throughout the whole of Canada, is a remarkably good showing. Col. Campbell has a group of enthusiastic young officers, many of them Queen's graduates, under him. It is reported that the Battalion will go over in the early summer to complete its training in England.—The surplus officers and men after the No. 15 Ambulance and Draft of Officers went overseas, has been organized into the No. 3 A.M.C. Training Depot (Queen's) with Major D. Kenneth Mundell in command and with an establishment of 23 officers and about 40 men. This unit will continue to supply drafts

for overseas as needed and will likely also supply in part the Officers for the Staff of the Military Hospital soon to be in operation in Grant Hall and the Kingston Building, which are about ready for their first patients.

Below are the figures shown by the University's Overseas Record up to the 31st March. In addition to these numbers the Committee has the names of some 40 others whom they have reason to believe to be on active service, but concerning whom particulars are not yet available.

ARTS—	Undergraduates (1914-15 and later)		
	Privates and N. C. O.'s	187	
	Officers	48	
	Graduates (1914 and earlier)		
	Privates and N.C.O.'s	40	
	Officers	93	
			368
SCIENCE—	Undergraduates (1914-15 and later)		
	Privates and N.C.O.'s	88	
	Officers	61	
	Graduates (1914 and earlier)		
	Privates and N.C.O.'s	38	
	Officers	96	
			283
MEDICINE—	Undergraduates (1914-15 and later)		
	Privates and N.C.O.'s	75	
	Officers	82	
	Graduates (1914 and earlier)		
	Privates	4	
	Officers	128	
			289
BANKING COURSES—			
	Privates	38	
	Officers	31	
			69
			1009

The record bears the names of forty-seven Queen's men who have been killed in action or died of wounds or sickness while on active service. Fifty-nine are recorded as having been wounded.

On the other hand Queen's men have had a generous share of Military distinction. Two have been made C.M.G. Three have received the D.S.O. Twenty-one Military Crosses have been awarded and four Military medals. There are seven D.C.M.'s, one Croix de Guerre, and one Royal Red Cross of the First Class. Twenty-one have been mentioned in official despatches.

H. T. Wallace, Secretary.

REPORT OF C.O.T.C. FOR 1916-17.

During the session 1913-14 Queen's had considered the advisability of establishing a Contingent of the Canadian Officers Training Corps. With the opening of the academic year in October, 1914, it was felt that an immediate service might be done for the country by organizing a corps at once with a view to preparing students for infantry commissions in the following spring. The corps was accordingly established and a class for the "A" (i.e. lieutenant's) certificate was offered with an attendance of over 200.

The course for the "A" certificate is by regulation a two years' course, but owing to the exigency of the times double the usual work was done and by the spring of 1915 about 150 men were able to pass the examination although the standard of examination was much higher than that usually exacted in infantry training schools before the war.

During the session 1915-16 the same course was again offered with the same excellent results. The tital number on the service roll of the corps in the spring of 1916 was 406. Of these 175 are now on active service or have joined overseas units. Many have infantry commissions in the C.E.F. or the B.E.F., others have joined artillery, engineer, or medical units, and a few are in the Imperial Flying Corps. If the average percentage of men physically unfit for military service be deducted from the total number on the roll, it will be seen that in providing 175 men for overseas service the Queen's University contingent of the C.O.T.C. has at least done an excellent recruiting service.

As a result of the large drafts made upon its numbers the contingent is this year reduced to 75. In this number are included 15 professors, and undergraduates who obtained their certificates in previous years. How many of these will join overseas units this spring it is not possible to say until the results of the C.O.T.C. examinations are published at the end of the present session.

The O.T.C. has given $500 to the Regimental fund of the 253rd Queen's University Highlanders Battalion, this amount having been earned by the corps in Government grants for "efficiency," etc. The members felt that, as the O.T.C. could not give so many men this year, a money grant in aid of this Battalian was their next best contribution.

Satisfactory as the work of the corps has been, it labours under two disabilities which greatly reduce its numbers. In the first place, Queen's has no building large enough for drill purposes, and as this work has to be done in the severest winter weather many drill hours have to be abandoned. In the second place too much work is expected of the students who join the corps. The work for the "A" certificate is more than equivalent to the hardest pass class in the academic curriculum whether it be regarded from the point of view of the number of hours or of the difficulty of the examination. If the O.T.C. is to be a success in the future this fact must be recognized and due allowance made for it.

Of the educational value of the O.T.C. there can be no question. The majority of the younger members of the staff have taken the course and it is their unanimous opinion that the work of the O.T.C. provides the best sort of physical exercise for students and at the same time sharpens the mind for academic study.

G. W. Mitchell, Capt. and Adjt., Queen's Cont., C.O.T.C.

QUEEN'S ALUMNI CONFERENCE.

The twenty-fifth annual conference of the Queen's Theological Alumni Association was held during the first week of November. In spite of war conditions the attendance was very good and the programme proved to be one of exceptional merit and interest. Professor Callander continued the series of the Chancellor's Lectureship, under the general title of "The Pagan World and The Christian Church. His four lectures attracted wide interest. The formal Opening of Queen's Theological College was addressed by Rev. Dr. Symonds of Montreal on "Theology and the War." Hon. N. W. Rowell, K.C., addressed the Conference on "England's Contribution in the War," and the remaining evening address was by Dean Cappon on "The Celtic Movement in Modern Literature." The more technical papers of the Conference maintained the high standard of theological scholarship for which the Conference has always stood. Rev. A. V. Brown of Picton, Rev. J. A. Shaver of Strathroy, Rev. J. H. Turnbull of Ottawa, Rev. A. G. Mackinnon of Lachine, and others contributed and the papers gave rise to some excellent discussions. Rev. N. M. Leckie was re-elected President, and Rev. E. R. McLean of Kingston, Secretary-treasurer. The Conference for 1917 will be held at about the same date.

APPENDIX TO REPORT ON RESEARCH.

The Committee append the following *list of published papers and researches* completed by members of the present staff.

Department of Metallurgy.

For the past fifteen years the Ore-Dressing Laboratory has been used as a Testing Laboratory. These investigations have been conducted principally by Professors Kirkpatrick, Gwillim and Drury, but some of the earlier researches were shared in by Professors W. G. Miller, W. L. Goodwin, and De Kalb.

The investigations on ores of cobalt, silver and nickel have required the constant employment of several assistants who have made valuable contributions to Ore-Dressing and Metallurgy. Messrs. G. C. MacKenzie (now of the Mines Branch, Ottawa), R. C. Cantelo and J. A. Read, may be mentioned. The following list of ores shows the variety of work that has been undertaken for mining companies.

Numerous stamp-battery tests on gold ores from Frontenac County and Porcupine district, Ontario, have been made.

Concentration tests on minerals containing graphite, molybdenite, scheelite (tungsten ore) from Nova Scotia, copper ores from Nova Scotia; corundum ores of Ontario; lead zinc ores of British Columbia; copper nickel ores of the Sudbury district; cobalt-nickel-silver-arsenical ores of Cobalt; and lead, zinc, copper, cobalt, nickel ores of Missouri, U.S.A.

In connection with the complex ores of Cobalt, Missouri, and the scheelite ores of Nova Scotia, and the gold ores of Porcupine, practical processes were developed in the laboratory of Queen's University and at present are being operated on a commercial scale. Since the processes were developed to treat the ores of Cobalt, the same company has continued the research work for the past seven years.

The products marketed from the treatment of cobalt ores are, cobalt and nickel oxides; cobalt and nickel metals; metallic silver, and arsenious oxide (As_2O_3).

An equipment has also been installed at the smelter treating the cobalt ores for the manufacture of stellite, a cobalt chromium alloy used as a substitute for high-speed tool steels. Stellite possesses valuable properties as a cutting tool and is meeting with a growing demand from those engaged in the manufacture of shells.

Mr. C. W. Drury has been experimenting since 1908 on the extraction of potash from feldspar and has patented a process to utilize the potash in feldspar for agricultural purposes.

The process consists briefly in charging feldspar, limestone, iron ore and coke into a blast furnace in the proportions of 2000, 1600, 400, and coke equal to 15 per cent. of the weight of the charge. The mixture melts and is removed from the furnace continuously as a liquid slag. This product has merely to be ground fine for use in mixed fertilizers. The cost to produce one ton of the fertilizer would be from $4 to $8.

Field experiments to determine the value of the feldspar fertilizer product as a plant food have been conducted on a small scale during the summers of 1915 and 1916.

From data obtained from fertilizer manufacturers, there is a ready market for the feldspar product. Manufacturers are willing to pay $1.50 per unit for the potash and $2.50 premium per ton because of the high lime content and also because the product is in a finely ground condition. There is an annual consumption in Ontario of potash of approximately 15,000 tons of the feldspar product.

Investigations already conducted show there are considerable quantities of feldspar containing 10 to 12 per cent. K_2O which would produce a finished feldspar product containing 7 to 8 per cent. K_2O worth $12.00 to $14.50 per ton.

Practically all the preliminary work with the process has been completed and the next step is the commercializing of the process.

To make a quantity of the feldspar fertilizer product and distribute it for testing, the estimated cost would be about $500.00. The work could be conducted in the Metallurgical Laboratory of Queen's University.

Department of Physics.

The members of the staff of the Physics Department have published papers as shown on the following list:

Papers by A. L. Clark, Ph.Dd., F.R.S.C.:

Determination of Angle of Lag in Inductive Circuits. Phil. Mag.
Specific Inductive Capacity of Oils.
Surface Tension at Interface between Liquids and Vapors.
Proc. Amer. Acad. of Arts and Sciences, Jan. 1906.
Density of Liquids and Refractive Index of Liquids in Contact.
Phil. Mag., Sept., 1912.
An electric Heater and Automatic Thermostat.
Pro. Amer. Acad. of Arts and Sciences, Jan. 1913.
Study of Resistance of Carbon Contacts. Phys. Review, Jan., 1913.
Resistance of Carbon Contacts in the Solid Back Transmitter.
Phys. Review, Jan., 1915.
Viscosity of Ethyl Ether near the Critical Temperature.
Trans. Roy. Soc. of Canada, 1915.
Critical Data for Air with Prof. Kuenen of Leiden, Holland.
Ready for Press.

By. W. C. Baker, M.A.:

Hall Effect in Gold for Weak Magnetic Fields. Phil. Mag., July, 1902.
Influence of Ultra Violet Radiation on the Discharge in a Vacuum tube having polished Zinc Electrode.
Proc. Camb. Phil. Soc. May, 1902.
The Absorption of Hydrogen by Metallic Films.
Phys. Rev., Nov., 1907.
Note on the Induction Coil Spark. Phys. Rev., Jan., 1915.
A New Method for the Measurement of Small Capacities.
Phys. Rev., Jan., 1916.
An Improved Resonance Model.
School Science and Mathematics, October, 1916.
A New Method for the Measurement of the Wave Length of Light with a Coarse Grating.
School Science and Mathematics, November, 1916.
The Angular Momentum Laws and a New Apparatus for their Verification. School Science and Mathematics, December, 1916.

By J. K. Robertson, M.A.:

"On the Charges gained by Insulated Metallic Conductors surrounded by other conductors and the relation of these charges to the Volta effect." Phys. Review, Vol. XXVII, No. 5, Nov., 1908.

"Note on the Temperature Variations in the Specific Resistance of Hensler's Alloys."
McTaggart and Robertson, Trans. Roy. Soc. Canada, 3rd series, Vol. II, Sec. III, 1908-1909.

"Magnetostriction of Hensler's Alloys"; included in paper by McLennan. Phys. Review, Vol. XXIV, No. 6, p. 458, June, 1907.

By V. E. Pound, M.A., Ph.D.:

"On the Radioactivity of Lead and Other Metals. With Prof. J. C. McLennan. Trans. Royal Soc. of Canada 1908.

The Absorption of the Different Types of Beta Rays together with a Study of the Secondary Rays excited by them.
Trans. Royal Soc. Canada, 1909, Phil. Mag., Jan., 1909.

1. On the Secondary Rays excited by the Alpha Rays from Polonium.
Trans. Canadian Institute, 1912, Phil. Mag., May, 1912.
2. On the Secondary Rays excited by the Alpha Rays from Polonium.
Trans. Canadian Institute, 1912, Phil. Mag., Sept., 1912.

Professor Clark's work on the Molecular Properties of Liquids and Vapors is supported by contributions from the Rumford Fund of the American Academy of Arts and Science. The publication of this work led to an invitation from Professor Onnes, of the University of Leiden, to undertake in his laboratory similar work at low temperatures. This work was carried out in collaboration with Professor Kuenen and the results are ready for publication.

Department of Botany.

By W. T. MacClement:

1. The Algae of Georgian Bay.
Contributions to Canadian Biology, 1911-14.
2. Control of Diatoms attacking Lobster larvae.
Contributions to Canadian Biology, 1915-16.

By G. B. Reed:

1. The Mechanim of the Oxidase Ferments concerned in Respiration.
Botanical Gazette and Journal of Biological Chemistry, 1914, 1915, 1916.
2. Investigation of Salt Marsh Peat on the Atlantic Coast.
Boston Society of Natural History.

Animal Biology.

Work done by Dr. A. P. Knight:

1. Effects of Polluted Waters on Fish Life.
Contributions to Canadian Biology, 1901.
2. Effects of Dynamite Explosions upon Fish Life.
Contributions to Canadian Biology, 1902-05.
3. Effects of Sawdust on Fish Life.
Transactions of Canadian Institute, 1904.
4. Fishery Bait Experiments.
Contributions to Canadian Biology, 1906-1910.

By T. L. Patterson:

1. Studies of Flesh-eating Insects.
   Journal of Entomology, 1911, Technical Series, Bureau of Entomology, 1911.
2. Studies in Gastric Hunger Contractions.
   Amer. Jour. of Physiology, March 1914, May 1915, June 1916, Dec. 1916.

By A. B. Klugh:

1. Bird Studies in Ontario.
   Pub. in Ottawa Naturalist, and Ontario Natural Science Bulletin, 1904-1910.
2. Fern Studies in Ontario. In Fern Bulletin, 1905.
3. The Cyperaciae of Ontario. In Ontario Natural Science Bulletin.
4. The Plant Formations of the Bruce Peninsula and the shores of Georgian Bay. In Ontario Nat. Sci. Bulletin.
5. The Aquatic Plants of Georgian Bay.
   In Contributions to Canadian Biology, 1915, and Rhodora, 1913.
6. The Mammals of the Bruce Peninsula.
   In Ontario Nat. Sci. Bulletin.

In Press:

1. The Algae of the Passamaquoddy Region.
2. Some unused Seafoods.
3. A new method of Reproduction in a Sea Anemone.

Pathology and Bacteriology.

By Dr. W. T. Connell:

Anthrax in Ontario. Dominion Medical Monthly, 1902.
Pathogenic Bacteria transmissible by milk.
Report of Ontario Executive Health Officer, 1900.
Carriers of Disease. Kingston Medical Quarterly, 1910.
Acidosis and acid intoxication.
Bulletin of Medical Faculty, Queen's University, No. 8, 1914.
Epidermic Meningitis. Canadian Med. Assoc. Jour., Oct. 1916.

Dairy Bacteriology.

Rusty discoloration of cheese.
Bulletin Dept. of Agriculture of Canada, 1897.
Bacterial contents of Canadian cheese. With Prof. Harrison ,of Guelph. Bulletin No. 130, Ontario Agricultural College.
Various investigations into off-flavored, ropy and sweet curdling milks, also of off-flavored, grassy and yeasty cheese, etc.
Annual reports of the Eastern Ontario Dairy Association, 1899, 1900, 1901, 1902, 1905, 1906, 1909.
Commercial pasteurization of whey. Farmers' Advocate, 1909.
Cheese Factory and Creamy Waters.
Eastern Dairymen's Association report for 1911, Canadian Public Health Journal, 1912.

Department of Geology.

The Geology Department has contributed during recent years to the development of the clay industries. Professor M. B. Baker has made a careful study of the clays of Ontario and has been able to give valuable

advice in improving methods and results. The results of his work have led to the establishment of the Meaford Brick Company, Limited, in which a very high grade of pressed brick is being carried out.

Professor Baker has also been studying the new nickel discoveries in the Porcupine district and field drilling is now going on under his advice.

Department of Chemistry.

By Dr. W. L. Goodwin:

1. Solubility of chlorine in solutions of chlorides.
2. Invaporation.
3. A nickeliferous pyrite.
4. Determination of corundum in corundum ore.

By Professor A. P. Lothrop:

The effect of bone ash in the diet on the gastro-intestinal condition of dogs, 1909.

A chemical study of saliva in tis probable relation to the decay of teeth. (With Wm. J. Gies), 1911.

The oral microorganisms; a bacteriochemical study of dental caries, 1911.

A chemical study of salivary mucin, 1912.

A further study of dental caries. (With Wm. J. Gies), 1913.

A further study of the effects of acid media on natural extracted teeth. (With Wm. J. Gies), 1914.

By Dr. Waddell:

1. Atomic weight of tungsten.
2. Absorption of water by salts and salt solutions.
3. The ternary system, benzine, acetic acid and water.
4. Freezing point determinations.
5. Reversible reaction ammonium thiocyanate and thiourea.
6. Indicators.
7. Volumetric determinations of lead.

By L. F. Goodwin:

Piperonaldazin and Derivatives.

Determination of Melting Points at Low Temperatures below 100°, in Transactions of the London Chemical Society.

Further determinations of melting points at low temperatures, Journal American Chemical Society.

Compounds of Hydrazine with Cobalt, nickel and zinc chlorides, part publication in Journal of Practical Chemistry.

Paper on Latent Heat of Fusion of Ice, Journal of Physical Chemistry.

New Types of weighing bottles. Journal American Chemical Society.

Specific Heats at low temperatures, with Sir Wm. Ramsay, unpublished.

The production of Radio-active elements by Bombardment with Kathode Rays in Helium carried out as Chief Carnegie Researh Assistant, with Professor Baskerville in New York. Results negative.

Investigation on the Efficiency of filling materials for the Absorption Towers used in Chemical Industry. Not published.

With Stern, Production of acetone from commercial acetate of lime.

With Bishop, Production of acetone by dtcomposition of acetic acid.

With Cantelo, Studies on T. N. T.

With McRae, Preparation with ammonium nitrate from ammonium sulphate and sodium nitrate.
Electrolytic preparation of cream of tartar.
Recovery of acetone in concentrations of two grains per cubic foot of air.
Production of synthetic phenol.

By W. O. Walker:
A short method for determining the percentage of casein in milk. Journal of Industrial and Engineering Chemistry, Feb., 1914.
Determination of Halogens in Organic compounds (With J. A. McRae). Journal of the American Chemical Society, April 1911.
Note on the precipitation of Lactalbumin in cow's milk. (With Cadenhead). Journal of Industrial and Engineering Chemistry, July 1914.
A rapid method of estimating the percentage of water in butter, cheese, etc. (With Mitchell). Farm Bulletin.
A new Babcock Test Bottle for butter fat in milk, cream, etc. (With Mitchell.) Farm Bulletin.
The problem of waste liquor from pulp mills. Journal of the Society of Chemical Industry, April 30, 1913.

QUEEN'S UNIVERSITY

Revenue and Expenditure from April 1, 1916 to March 31, 1917.

Receipts

Fees	$ 49,551 83	
Interest	52,785 88	
Jubilee Fund Interest	220 56	
Rent of Houses and Rinks	3,840 60	
Chancellor's Lectureship	250 00	
Observatory	500 00	
School of Navigation	500 00	
Salaries—		
Theol. College and Med. Fac. on acct of Salaries	4,800 00	
Eastern Dairy School	600 00	
Augmented Revenue, subscriptions paid	2,470 00	
Central Plant	15,035 68	
Ontario Government—		
School of Mining	67,000 00	
Queen's University	18,000 00	
Dr. Douglas' Gift, Paying Deficiency	61,057 90	
Overdraft, 1916-17	13,203 30	
		$289,815 75

Expenditures

Deficiency Accumulated	$ 11,637 01
Deficiency, 1915-16	13,612 42
Deficiency, School of Mining, 1915-16	35,808 47
Advertising	3,409 55
Botany	498 55
Contingencies	1,880 70
Chancellor's Lectureship	250 00
Expense, Com. on Loans and Collections	2,497 28
Banking	4,517 59
Fees, Athletics	1,272 00
" Arts Society	304 00
" Levana Society	195 00
" Engineering Society	212 50
Fuel and Light	4,205 09
Grounds	488 71
Interest on Scholarships	2,398 50
Interest, Library Building	7,244 29
Insurance	1,046 95
Library	2,632 00
Printing and Stationery	4,510 39
Repairs Taxes and Expenses of houses rented	930 77
Repairs and Improvements to University Buildings	777 90
Salaries	132,790 79
Summer Session	2,850 33
Stamps	2,448 37
School of Navigation	526 90
Travelling Expense	1,139 11
Taxes on University Grounds	1,307 19
Central Plant	20,397 87
Chemistry	4,618 29
Civil Engineering	1,445 80
Electrical Engineering	1,107 78

Engineering Field Work	556 39	
Geology	572 92	
Science Library	552 59	
Mechanical Engineering	1,349 97	
Mining and Metallurgy	2,737 76	
Mineralogy	632 17	
Museum (Science)	1,013 09	
Nicol Hall Interest	1,800 00	
Physics	2,003 52	
Workshop	322 73	
Accounts Receivable, written off	9,312 51	
		$289,815 75

Audited and found correct,

R. Easton Burns,
Chartered Accountant.

April 7th, 1917.

QUEEN'S UNIVERSITY—MEDICAL FACULTY

Revenue and Expenditure from April 1, 1916 to March 31, 1917.

Receipts

Ontario Government	$ 14,000 00	
Fees	30,306 75	
Dr. Douglas' gift paying, Overdraft, 1915-16	2,173 06	
Overdraft, 1916-17	2,753 98	
		$ 49,233 79

Expenditures

Overdraft, 1915-16	$ 2,173 06	
Salaries	35,736 63	
Fees, Athletics	518 00	
Fees, General Hospital	1,169 00	
Fees, Hotel Dieu	233 80	
Fees, Chemistry and Physics	2,405 00	
Expense, Heat and Light	1,560 00	
Expense, Biology	308 21	
Expense, Sundry Expenses	3,446 82	
Library	454 73	
Laboratory	800 00	
Printing and Stationery	428 54	
		$ 49,233 79

Audited and found correct,

R. Easton Burns,
Chartered Accountant.

April 7th, 1917.

FACULTY OF EDUCATION, QUEEN'S UNIVERSITY

Revenue and Expenditure from Jan. 1, 1916, to Dec. 30, 1916.

Receipts

Surplus from 1915	$ 113 44	
Ontario Government	12,000 00	
Fees	1,808 00	
Overdraft	08	
		$ 13,921 52

Salaries—	*Expenditures*	
Salaries	$ 7,598 00	
Board of Education, as per agreement	5,000 00	
Travelling Expense	181 70	
Presiding Examiners	240 40	
Printing and Stationery	442 23	
Advertising	250 00	
Library	150 00	
Office Furniture and Equipment	12 94	
Sundries	46 25	
		$ 13,921 52

Audited and found correct,
R. Easton Burns, Chartered Accountant.
January 9th, 1917.

QUEEN'S UNIVERSITY

Statement showing Assets and Liabilities March 31st, 1917

Assets		
Bills Receivable	$ 640 00	
Bonds, Debentures and Stocks	294,445 23	
Faculty of Education	1,794 42	
Lands, Buildings and Equipment	301,483 62	
Loans to Students	881 25	
Mortgages	695,423 35	
Revenue and Expenditure	13,203 30	
Deficit, 1916-1917		
Medical Revenue and Expenditure	2,753 98	
Deficit, 1916-1917		
Cash in Merchants Bank	15,986 95	
Accounts Receivable		
Queen's 72nd Battery	134 60	
Queen's Engineers	316 65	
Military Hospitals Comm.	500 53	
		$1,327,563 88

Liabilities			
Alma Mater Reserve Fund		$ 500 00	
Douglas Tutorship		454 40	
Endowment Fund		832,722 70	
Endowment Scholarship Fund		58,634 10	
Library Building Fund		155,383 49	
1909 Foundation		1,045 30	
1910 Arts Memorial Fund		4 88	
1912 Arts Memorial Fund		226 40	
Profit and Loss		274,785 52	
Scholarships and Prize Essays—			
Balance from 1915-16	$2699 59		
Cash Rec.	544 00		
Interest	2398 50		
	2942 50		
	$5642 09		
Less Schol. paid 1916-17	1835 00		
		3,807 09	
			$1,327,563 88

Audited and found correct,
R. Easton Burns, Chartered Accountant.
April 7th, 1917.

QUEEN'S UNIVERSITY

Bonds and Stocks

Bonds—		
Port Arthur, 5%, due 1921	$ 10,000 00	
Saulte Ste Marie, 4%, due 1922	10,000 00	
Fort William, 4½%, due 1922	12,500 00	
Nelson, 5%, due 1921	10,000 00	
Grand View, 6-$740 each, due 1917-1922, Book value	4,026 40	
Laurentide Pulp Company, 6%, due 1920	5,000 00	
Dominion Iron & Steel, 5%, due 1929, Endowment Sir Sandford Fleming Lectureship	5,000 00	
Walkerton 10 bonds, due 1917-1921, Book Value	2,018 83	
Dominion War Loan, 5%, due 1925	50,000 00	
Dominion War Loan, 5%, due 1921	25,000 00	
Anglo-French War Loan, 5%, due 1920, Library Fund	150,000 00	
Dominion War Loan, 1917, 10% on subscription $115,000	11,500 00	
Stocks—		
60 Preferred Shares, Dominion Iron & Steel, book value, (Endowment Sir Sandford Fleming Scholarships)	5,000 00	
Bank of Toronto, 4 shares, book value	1,000 00	
Toronto Mortgage Company, 23 shares, book value	1,150 00	
		$302,195 23
Difference between cost and face value		7,750 00
		$ 294,445 23

QUEEN'S UNIVERSITY MORTGAGES IN PROVINCES

Ontario

A. 3	$ 1,725 00	Mc. 7	2,300 00
A.29	4,782 18	Mc.17	6,500 00
B. 1	1,107 11	Mc.43	3,500 00
B. 5	1,407 50	O. 9	1,816 25
B.11	2,000 00	O.15	3,250 00
B.25	700 00	P. 4	2,100 00
C. 7	1,100 00	P. 6	5,500 00
C.11	1,500 00	P.10	10,000 00
C.17	2,286 86	P.25	3,300 00
C.29	416 22	P.27	2,900 00
C.31	2,000 00	R. 3	9,088 63
D.35	1,000 00	R. 5	750 00
G. 1	2,698 24	R. 7	1,600 00
G. 7	500 00	R.35	700 00
G.10	5,000 00	R.49	600 00
G.11	13,300 00	S. 3	600 00
H. 1	1,343 93	S.30	8,000 00
H.27	400 00	S.35	1,300 00
H.47	3,000 00	S.36	2,900 00
I. 5	900 00	S.37	309 00
J. 3	4,000 00	S.59	3,500 50
J. 5	9,395 00	S.75	20,000 00

J.15	2,800 00	W. 1	828 60
J. 19	6,200 00	W.11	161 85
K. 1	700 00	W.37	5,200 00
K.23	1,100 00	Y. 3	3,977 00
L.10	2,547 50	Y. 5	18,000 00
M.24	4,000 00		
M.35	7,500 00		$213,491 37
M.39	3,400 00	Less	1,000 00
M.43	6,000 00		
			$212,491 37

Manitoba

A.13	$ 3,635 00	L. 2	1,800 00
A.21	2,500 00	L. 4	2,000 00
A.23	3,000 00	L. 5	4,900 00
A.25	3,000 00	L. 6	1,100 00
A.27	3,000 00	L. 8	1,700 00
B.12	4,351 60	L.29	800 00
B.14	1,450 00	L.31	2,500 00
B.17	4,500 00	L.33	2,200 00
B.18	700 00	M. 4	1,500 00
B.19	21,000 00	M. 7	4,630 00
B.20	2,034 00	M. 8	1,990 29
B.22	2,400 00	M. 9	5,000 00
B.31	2,500 00	M.14	2,204 70
B.35	3,030 00	M.15	2,800 00
B.63	3,000 00	M.16	800 00
B.65	4,800 00	M.18	1,200 00
B.67	3,000 00	M.19	1,600 00
B.69	975 00	M.20	2,100 00
B.73	8,000 00	M.22	1,150 00
C. 2	6,970 00	M.25	1,500 00
C. 4	4,800 00	M.31	4,029 00
C. 8	1,200 00	M.33	5,000 00
C.12	1,000 00	M.37	1,950 00
C.14	2,000 00	Mc. 4	3,952 74
C.19	5,014 00	Mc. 8	2,750 00
C.33	1,100 00	Mc. 9	3,506 10
C.37	1,600 00	Mc.10	2,100 00
C.71	3,055 00	Mc.19	2,022 00
C.75	3,300 00	Mc.23	2,400 00
C.81	3,500 00	Mc.41	2,400 00
C.87	1,700 00	N. 3	2,600 00
C.89	1,800 00	N. 9	2,000 00
C.91	1,488 10	O.13	5,000 00
D.23	2,500 00	P.13	500 00
E. 2	400 00	P.15	2,408 00
E. 3	600 00	P.17	1,307 00
E. 4	1,550 00	P.19	900 00
E. 7	708 00	P.23	5,000 00
E.11	2,800 00	P.29	2,450 00
F. 6	600 00	R.39	3,013 25
F. 8	1,656 16	R.55	2,200 00
F.13	950 00	R.57	5,000 00
F.19	2,600 00	S. 4	3,828 00
F.41	900 00	S.12	1,500 00
F.49	3,001 75	S. 14	5,501 36

F.51	4,097 27	S.16	1,800 00
F.53	2,000 00	S.23	984 80
G. 2	2,000 00	S.32	2,232 00
G. 4	2,000 00	S.43	575 00
G. 6	1,300 00	S.51	1,100 00
G. 8	2,000 00	S.55	1,794 32
G.12	2,500 00	S.67	10,051 70
G.21	900 00	S.69	6,000 00
G.25	700 00	S.73	1,000 00
H. 2	1,300 00	S.77	1,000 00
H. 6	3,001 40	S.79	2,500 00
H. 8	1,050 00	S.81	500 00
H.13	950 00	T. 3	2,700 00
H.14	4,000 00	T.13	2,509 80
H.18	2,612 00	T.15	6,100 00
H.20	675 00	T.17	1,810 00
H.26	1,300 00	T.19	1,699 35
H.28	800 00	T.23	825 00
H.39	1,350 00	V. 1	338 81
H.41	3,600 00	V. 3	1,800 00
H.45	2,000 00	V. 9	1,800 00
H.49	1,500 00	W. 2	1,500 00
H.51	3,000 00	W. 7	3,500 00
J.11	3,000 00	W.21	2,152 00
J.13	700 00	W.23	4,250 00
J.17	1,200 00	W.29	2,200 00
J.21	1,700 00	W.31	950 00
K.19	5,300 00	W.35	2,225 00
K.22	1,503 00		
K.25	1,000 00		
			$375,397 50

Saskatchewan

A.17	$ 4,000 00	H.10	1,600 00
A.19	800 00	H.12	3,600 00
C.59	1,110 00	H.16	1,667 28
C.73	1,100 00	H.43	1,600 00
C.83	1,500 00	K.27	900 00
D.33	1,200 00	M.41	3,500 00
D.37	8,900 00	Mc.2	2,000 00
D.39	2,500 00	S.20	1,065 61
E.13	6,000 00	T.11	2,000 00
F.37	1,400 00	V.13	5,000 00
F.39	700 00	W. 4	2,050 00
F.47	687 40	W.39	2,500 00
G.27	1,011 30		
G.29	880 50		
H. 4	1,281 95		$ 60,554 04

Alberta

A.11	$ 606 00	Mc.33	6,110 45
C.57	4,114 00	Mc.37	3,500 00
C.63	284 01	P. 9	1,400 00
G.23	624 00	R.45	900 00
G.33	9,296 00	S.28	8,000 00
K.15	1,145 98		
L.27	3,000 00		$ 38,980 44

British Columbia

Mc.35	$ 3,000 00
S. 6	5,000 00
	$ 8,000 00

Summary

Manitoba	$375,397 50
Ontario	212,491 37
Saskatchewan	60,554 04
Alberta	38,980 44
British Columbia	8,000 00
	$695,423 35